THE AUTOMOBILE

WEEKLY NEW YORK—THURSDAY, APRIL 4, 1907—CHICAGO 10 CENTS

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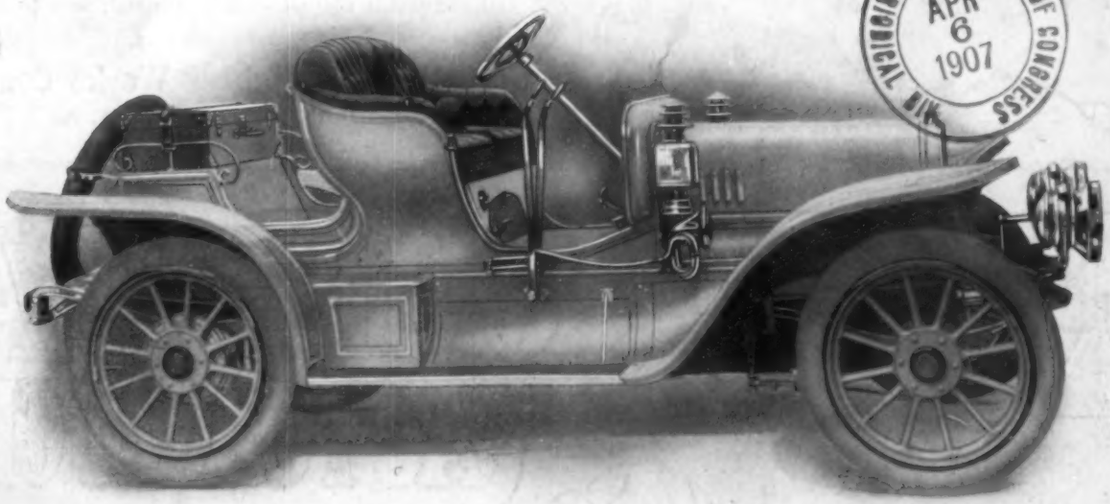

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THE AUTOMOBILE

HOW THE ~~A.A.A.~~ TOURISTS WILL COMPETE FOR THE GLIDDEN TROPHY

PERCY PIERCE STARTING ON THE 1905 A.A.A. TOUR.

CHAIRMAN F. B. HOWER and his associates on the Executive Committee of the A. A. A. Touring Board have completed a task which has been complicated and difficult and well nigh impossible of accomplishment in such manner as to satisfy all interests involved in the conduct of the annual A. A. A. tour for the Glidden and perhaps other trophies. Many conferences were held, involving owner and maker, and licensed and unlicensed, and the result should be the running of the largest and most successful semi-endurance tour ever held in this or any other country. All signs point to such an outcome.

July 10 will witness the start of the automobile cavalcade from Cleveland. Westward it will head for Chicago, but the exact route over which it will reach the bustling city on the shores of Lake Michigan is yet to be figured out. In its calculations the committee in charge is giving the most careful consideration to the question of night accommodations, and this may mean the elimination of several cities which would not exactly fit into a schedule calling for an average of about 125 miles a day. This requirement is none too easy over American roads.

In order to give the Westerners an opportunity of lavishing their bounteous hospitality upon the touring army, there will be a stop of a couple of days in Chicago. Then will follow the Eastward run, with its conclusion in New York City on or about July 23. Through peaceful Indiana, across fertile Ohio, a brief look at West Virginia, and then traversing the entire length of rugged Pennsylvania, perhaps dropping down into Washington and Baltimore. the caravan will have arrived in Philadelphia. Whether the Sunday stop will be in Atlantic City and the entry into New York up the Jersey shore is a problem to be taken care of by the sub-committee which shortly will make the preliminary survey. The total mileage will be about 1,400 miles, and will include all sorts and conditions of American roads, long stretches of level country and many miles of mountainous traveling. But the automobile of to-day should meet the test victoriously.

Much favorable comment has resulted from the plan evolved by the committee as to the disposal of the Charles J. Glidden trophy, which this time will go to the club whose entrants proportionately finish with the greatest total of points. Of course, a club to contest for the trophy must supply at least three entrants, but the owner of every car finishing the tour will receive a certificate giving its exact standing, those completing the entire journey without penalization of any kind to have their certificates marked "Perfect." This will be a harder undertaking than ever before. Those surviving without losing points will earn the honor.

In its compilation of the rules the executive committee took the consensus of opinion as the basis of the conditions decided upon, the leading manufacturers expressing themselves as desiring to enter cars in a contest which would demonstrate the reliability and endurance qualities of their product. True it was that some argued for a pleasure tour pure and simple, and such it may be partially, but in strenuous degree. Nevertheless, provision is made for a division of non-contestants, which is to be a part of the tour and still relieved from the necessity of engaging in the struggle for the Glidden trophy. Those losing their right to contest for the trophy may, after having become disbarred through failure to comply with the rules, in the judgment of the committee, enter the non-contesting ranks for the remainder of the tour.

Replacement of parts not carried this year will be visited with penalties, and there will not be any such latitude as was permitted in the 1906 event. Each entrant will be required to furnish the manufacturer's list of regular standard equipment and price list of all extra parts carried. For any part replaced with parts not regularly furnished as standard equipment by the manufacturer there will be penalizations according to a schedule which would appear to have been carefully thought out. Before starting the entrant will be required to furnish an inventory of all extra parts carried in his car, and this information will be a matter of record. Only the driver and his mechanician will be permitted to participate in making any repairs or replacements. In the matter of tires a car may carry as many as its owner desires. A daily record of new parts placed on a car and any repairs or adjustments made will be required from the entrant. Failure to do so, fully and correctly, will be considered sufficient cause for disqualification.

It will be remembered that last year the fluctuating of watches caused trouble on several occasions. In the imposing of penalties

for reaching controls ahead of or behind schedules an allowance will be made of two minutes for variation in watches. Penalties

CHAIRMAN F. B. HOWER, HEAD OF THE A. A. A. TOURING BOARD.

will be effective for each minute or fraction thereof in excess of the aforesaid two minutes.

In the penalty schedule each club of three members starts out with a credit of 1,000 points, and for each additional car points are proportionately added. Penalizations are made on a sliding scale, both in time arrivals and replacement of parts.

An example of parts penalization is given in the rules as follows: "A club of three cars, one of which replaces a spring valued at $10, will be penalized 3 1-3 points, which is 1-3 of a point for each dollar. A club of ten cars, one of which should do precisely the same thing, will be penalized one point, or 1-10 of a point for each dollar."

An example of time penalization is explained thusly: "A club of four cars, one of which is three minutes late arriving at a control, will be penalized 1-4 of a point for the one minute over and above the two-minute allowance. A club of eight cars, one of which is three minutes late arriving at a control, will be penalized 1-8 of a point for the one minute in excess of the two-minute allowance."

Chairman Hower is particularly urgent for early entrance, and desires that particular attention be called to the fact so the committee will have opportunity of giving early attention to the hotel and other similar arrangements and thus insuring an improvement over the general accommodations which brought about so much dissension a year ago.

The executive committee which will have the burden of the tour includes, besides its chairman, L. E. Myers, Chicago; Philip S. Flinn, Pittsburg; James B. Dill, East Orange, N. J., and Dai H. Lewis, secretary. All are experienced and capable men, and have toured thousands of miles under all sorts of conditions of roads and weather.

Judging from the extraordinary amount of interest manifested in the tour, it is anticipated that the entry list may exceed 100, and the entire caravan may embrace some 600 or more people.

During the preparation of the rules for the tour a strong effort was made to have the contest for the Glidden trophy open both to touring cars and touring runabouts; in fact, the N. A. A. M. committee was very much in favor of including the runabouts. Chairman Hower agreed to leave the matter to a decision of the A. A. A. Board of Directors. The subject was discussed at the March 27 session, and, while it was freely admitted that runabouts had made vast strides in popularity during the past year and a large sale was presaged for this season, it was argued and voted that the admission of runabouts might discourage the entering of the big touring cars.

It is likely that the Executive Committee will discuss at its next session the advisability of placing a trophy in competition for the runabout class, especially if early entrants make known their desire to contest for a runabout cup rather than participate with a heavier and more commodious car for the Glidden trophy. It has been stated from various sources that a large number of runabouts will be available if provision is made for this class of car. A score of such entrants seem to be assured.

Percy Pierce, of the Automobile Club of Buffalo, was the winner of the 1905 tour, the first contest for the trophy. A provision in the deed of gift left the trophy in the possession of the winner until it was won by another. The 1906 event resulted in a tied score by thirteen cars, one of which was driven by Percy Pierce, and therefore he retained the trophy. The revised conditions make it impossible for the Bison to make himself a three-time holder, but he can assist his club in keeping the trophy in Buffalo.

RULES GOVERNING THE 1907 A. A. A. TOUR

CONCERNING ENTRANTS.

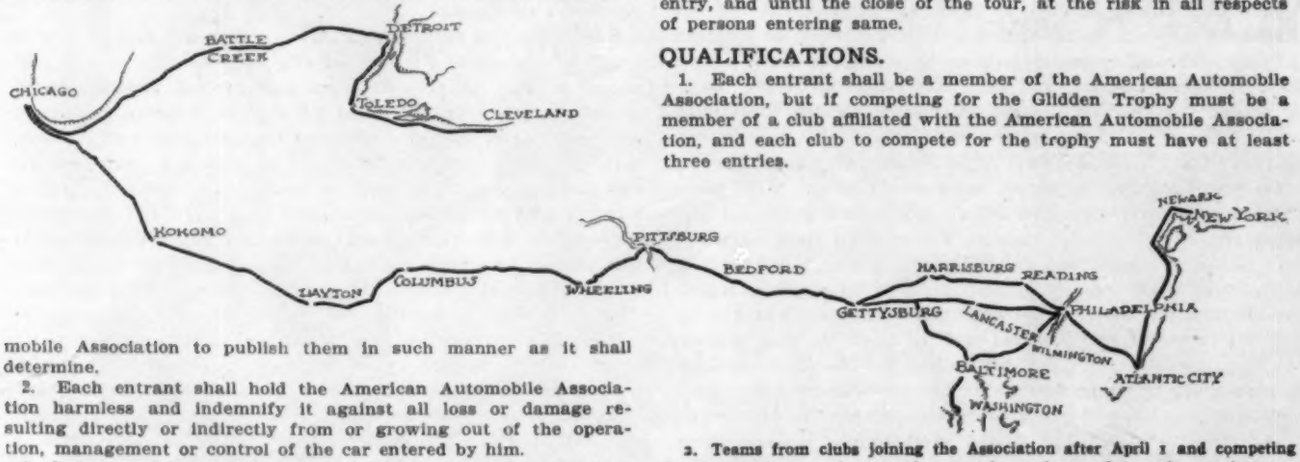
1. It will be assumed that every entrant is acquainted with these rules, and by entering for the tour agrees to abide thereby, agrees to accept the official records, and authorizes the American Automobile Association to publish them in such manner as it shall determine.

2. Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management or control of the car entered by him.

3. It is one of the conditions upon which entries of cars are accepted by the American Automobile Association, that said American Automobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

QUALIFICATIONS.

1. Each entrant shall be a member of the American Automobile Association, but if competing for the Glidden Trophy must be a member of a club affiliated with the American Automobile Association, and each club to compete for the trophy must have at least three entries.



2. Teams from clubs joining the Association after April 1 and competing for the Glidden or other trophies must be made up of cars of more than one manufacture.

ENTRIES.

1. The time for receiving entries will expire on July 3, 1907, at 12 o'clock noon, at the office of Frank B. Hower, Chairman Touring Board, 760 Main street, Buffalo, N. Y. Each entry for the 1907 event must be accompanied by the entrance fee—$100. Numbers for the tour will be issued in the order in which the entries are received.

2. Each entrant shall give all details asked for in the entry blank and such additional information as the committee may from time to time require.

3. The American Automobile Association reserves the right to refuse any entry.

TOURING CONDITIONS.

1. Each car entered shall be driven by the entrant, or a driver or drivers nominated by him and approved by the committee; when the car is driven by other than the entrant, the latter shall ride in the car, unless excused by the committee.

2. Cars must at all times during the tour carry mufflers and mudguards, and be equipped as per manufacturer's catalogue specifications: shall carry not less than four passengers of an average weight of 125 pounds or other equivalent in ballast, and shall have touring car bodies with tonneau.

3. No replacements, replenishments, adjustments, repairs or inspection shall be made upon any car after the same shall have been registered at any night stop of the tour, and before it shall have registered out the next succeeding morning. No replacements (except tires) shall be made with parts not inventoried and carried at the start, and if replacements, except as above specified, are made, the entrant may continue the tour, but not as a contestant. Each entrant may carry as many tires as desired.

4. Each car shall have its official number prominently displayed on each side, or in front and rear.

5. No record of any previous performance, or sign, or other indication of the maker's name, other than the nameplate, usually attached to the vehicle as sold to private owners, shall be displayed on any car at any time during the tour.

6. The trophy will be awarded to a club, but the score of each individual car will be recorded during the tour, and at the finish of the contest each entrant, unless previously disqualified, will receive a certificate in accordance therewith.

7. Each entrant must furnish the manufacturer's list of the regular standard equipment and the manufacturer's price list of all extra parts carried, and for any parts replaced with parts not regularly furnished as standard equipment by the manufacturer, contestants will be penalized as per penalty schedule hereinbelow set out.

8. Each entrant must furnish an inventory, previous to the start, of all extra parts carried in his car, and the same shall be put in the records.

9. A car may carry but one mechanician, and all repairs must be made by him, the operator, or both, and no one else shall participate in any way in making any repairs or replacements.

10. A statement must be made by the operator and attested by each occupant of the car at the conclusion of each day's run, as to what new parts were put on the car and what repairs or adjustments, if any, were made, and failure to do so, fully and correctly, shall disqualify.

ROAD REGULATIONS.

1. Entrants must conform to all laws and ordinances and rules of the road, and any entrant violating any of the provisions of these rules, or of other rules adopted by the committee, or who shall fail to show due consideration to other participants in the tour, or other users of the highways, may be disqualified by the committee.

2. Any car whose owner or driver shall be arrested for a violation of speed laws, or of any law or ordinance, may, in the discretion of the committee, be disqualified.

CONTROLS.

1. All contestants must have their cars ready at 7 o'clock each morning. Checkers will be at their stations at that time prepared to start the cars.

2. Each entrant must, upon starting on each day's run, sign a statement submitted by an official of the tour fixing the time of his departure. Failure to comply will result in disqualification. Each day's tour shall be preceded by a pacemaker, designated by the committee, and any entrant who passes the pacemaker shall be disqualified. If the pacemaker breaks down or is compelled to travel at a rate of speed so slow as in the opinion of the committee to unduly impede the progress of the tour, his flag shall be transferred to the first car overtaking him, which car shall thereafter become pacemaker, subject to the same conditions.

SCHEDULES.

1. The committee will publish a schedule for each day, establishing such checking points as it may deem proper. This schedule will fix the exact time when each car must reach each control, and when it shall finish each day's run, but will not require any entrant to operate his car at a higher rate of speed than is permitted by law. Each car failing to reach controls, or to finish the day's run at the time fixed by the schedule, will be penalized according to the penalty schedule herein given. The committee shall have power to disqualify any car for traveling at any speed which the committee may consider excessive under the conditions existing at the time, and without reference to these rules.

2. On arrival at night controls, each car must take its place in line and register in regular order. Cars failing to do so, will be disqualified. Contestants for the Glidden Trophy shall, however, be entitled to precedence in registration over non-contestants.

3. Immediately following the registration at each night control, each car shall be delivered into the custody of the officials of the tour, to be by them held at owner's risk, and kept under direct charge and supervision of such officials or their agents until the hour for starting on the following morning, and no car shall be available for tuning up, adjustments, filling with gasoline or water, or for any other purpose, until after it shall have registered as starting on the next day's run. The committee shall have power, etc., at all times to make such examinations of the cars and their contents as may be deemed advisable.

PROTESTS. DISQUALIFICATION.

1. Any participant in the tour desiring to file a protest must first deposit the sum of $10 with a member of the committee, which sum will be retained by the American Automobile Association if the protest is not sustained, and if the protest is sustained the protest fee will be returned to the person making such deposit. All protests must be made in writing, and will be considered by the committee at the earliest practicable moment, and a decision rendered as soon as practicable thereafter.

(a) All protests as to entries must be made before the start.

(b) All protests as to unfair ruling, route, etc., must be made within twenty four hours after the occurrence.

(c) All other protests shall be made during or immediately after the tour is concluded, and before the award is made.

2. No entrant or car will be disqualified until the person in charge shall first have been notified of the act complained of, and if the act be denied, the committee will give the owner or person in charge of such car a hearing, after which a decision will be rendered. Upon notice that such car has been disqualified, it shall cease to run in the contest, the official numbers shall be removed, and such entry shall not receive any certificate, but shall be mentioned in the records as having been disqualified, and no entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the American Automobile Association, or any member or members of the committee or any official of the tour, because of such disqualification or the publication thereof or failure to mention the performance of the disqualified car prior to its disqualification.

SPECIAL TRIALS OR TESTS.

1. In the event of a tie at the end of the tour, the committee may require such other and further trials or tests as it may deem necessary or advisable to establish the awarding of the trophy.

PENALTY SCHEDULE.

The Glidden Trophy will be awarded to the club having the greatest number of points at the end of the contest. The method of scoring will be as follows:

Club of	Initial credit	Penalizations per minute or fraction thereof in excess of two minutes at controls.	Penalizations per dollar or fraction thereof of value of parts as per manufacturer's price list.
3 cars	1,000	1-3 point	1-3 point
4 "	1,010	1-4 "	1-4 "
5 "	1,020	1-5 "	1-5 "
6 "	1,060	1-6 "	1-6 "
7 "	1,100	1-7 "	1-7 "
8 "	1,150	1-8 "	1-8 "
9 "	1,210	1-9 "	1-9 "
10 "	1,280	1-10 "	1-10 "

Penalties will be imposed for reaching controls ahead of, or behind schedules. Two minutes will be allowed for variation in time pieces. Penalties will be effective for each minute or fraction thereof in excess of aforesaid two minutes.

EXAMPLE. PARTS PENALIZATION.

A club of three cars, one of which replaces a spring valued at $16, will be penalized 3 1-3 points, which is 1-3 of a point for each dollar. A club of ten cars, one of which should do precisely the same thing, will be penalized one point, or 1-10 of a point for each dollar.

EXAMPLE. TIME PENALIZATION.

A club of four cars, one of which is three minutes late arriving at a control will be penalized 1-4 of a point for the one minute over and above the two-minute allowance. A club of eight cars, one of which is three minutes late arriving at a control, will be penalized 1-8 of a point for the one minute in excess of the two-minute allowance.

NON-CONTESTANTS OF THE TOUR.

1. In order to provide for those who desire to participate in the annual A. A. A. Tour, and do not care to contest for the Glidden or other trophies, a separate class of "Non-Contestants" is created, and those coming under this head will not be subject to Articles 2, 3, 6, 7, 8, 9, 10 of "Touring Conditions"; Articles 1 and 2 of "Controls"; Articles 1, 2, 3 of "Schedules"; and Article 1 of "Special Trials or Tests."

HOW DISQUALIFIED CARS MAY CONTINUE.

1. Contestants for the Glidden Trophy failing to comply with the rules governing same, and thereby losing their status as contestants, may, in the discretion of the committee, continue on the tour as "Non-Contestants."

POWERS OF COMMITTEE.

1. In the event of a dispute concerning the interpretation of the rules, the decision of the Executive Committee of the Touring Board of the American Automobile Association shall be final.

2. The Executive Committee of the Touring Board reserves the right to alter or amend, suspend, or repeal these rules from time to time, up to and including the end of the tour and final award, as may in its judgment be deemed expedient.

PROGRESSIVE A. A. A. ACTIVITY BRINGING RESULTS

THAT the Hotchkiss administration of A. A. A. affairs is certain of doing much was apparent at the spring meeting of the Board of Directors, held in New York City, March 27, at the clubhouse of the Automobile Club of America. Two State associations were added to the membership list, Connecticut and Minnesota becoming part of the national organization. Applications from Rhode Island, Maryland, Indiana, Michigan, Wisconsin, Kentucky, Missouri and Iowa are expected soon.

Recognizing that racing results in some benefits of a substantial nature to the industry, the directors sanctioned a suggestion from a coterie of well known makers that a contest for American touring cars be conducted soon after the annual Vanderbilt Cup race in October next. The event would be limited to regular stock touring cars, except that the chasses would be mounted with racing instead of touring bodies. The subject was referred to the Racing Board with power to arrange such a contest.

It was decided to designate the second Wednesday of June in each year as a National Orphan's Day, A. A. A. clubs being asked to hold their affairs of this character this year on Wednesday, June 12, if local conditions permit.

President Hotchkiss recommended the formation of two new boards one to be known as the Technical Board and the other the Publication Board. The duties of the Technical Board, made up of automobilists without trade affiliations, would be to conduct such tests as might be suggested to determine the worth of automobiles in general and their different parts and appliances. The work of the Publication Board would be the preparation of a year book, digests of State laws, maps and route cards, and possibly a monthly bulletin. The establishment of two such boards was referred to the Executive Committee.

Exhaustive reports were presented by Chairman Terry of the Legislative Board, who had prepared the draft of a model State law; Chairman Hooper of the Good Roads Board, who recommended that State committees of his board be formed in States where there were no State bodies; and Chairman Hower of the Touring Board, who gave the conditions for the annual tour.

The roll call showed the following directors present:

President, William H. Hotchkiss, Automobile Club of Buffalo.
First Vice-president, Lewis R. Speare, Bay State Automobile Assn.
Charles Thaddeus Terry, chairman Legislative Board.
Frank B. Hower, chairman Touring Board.
Robert P. Hooper, chairman Good Roads Board.
Secretary, Frederick H. Elliott, Automobile Club of Syracuse.
Osborne I. Yellott, Automobile Club of Maryland.
Sidney S. Gorham, Chicago Automobile Club.
J. H. Morse, Automobile Club of Hartford.
Walter E. Edge, Atlantic City Automobile Club.
John P. Coghlin, Worcester Automobile Club.
A. R. Pardington, Brooklyn, N. Y.
A. G. Batchelder, New York Motor Club.
George A. Post, North Jersey Automobile Club.
J. H. Edwards, Automobile Club of Hudson County (N. J.).
W. H. Chase, Wauchusetts Automobile Club (Mass.).
Walter C. White, Cleveland Automobile Club.
George H. Smith, Quaker City Motor Club (Penn.).

Earlier in the day and preceding the meeting of the Board of Directors, there were sessions of the Legislative and Good Roads Boards, considerable work being outlined for the near future. There was no meeting of the Racing Board, owing to the indisposition of Chairman Jefferson De Mont Thompson.

HOTCHKISS ADDRESSES OHIO STATE BODY.

CLEVELAND, April 1.—At the annual meeting of the Ohio State Automobile Association, held Saturday at the clubrooms of the Cleveland Automobile Club, five clubs were represented: Cleveland, Cincinnati, Springfield, Lima, and Elyria. President F. T. Sholes presided and presented a very satisfactory report.

President W. H. Hotchkiss, of the A. A. A., made an enthusiastic address wherein he dwelt upon the necessity for a national organization, particularly calling attention to the need of a Federal law which will permit an automobilist to go anywhere in the country after having complied with the registration law of his own State.

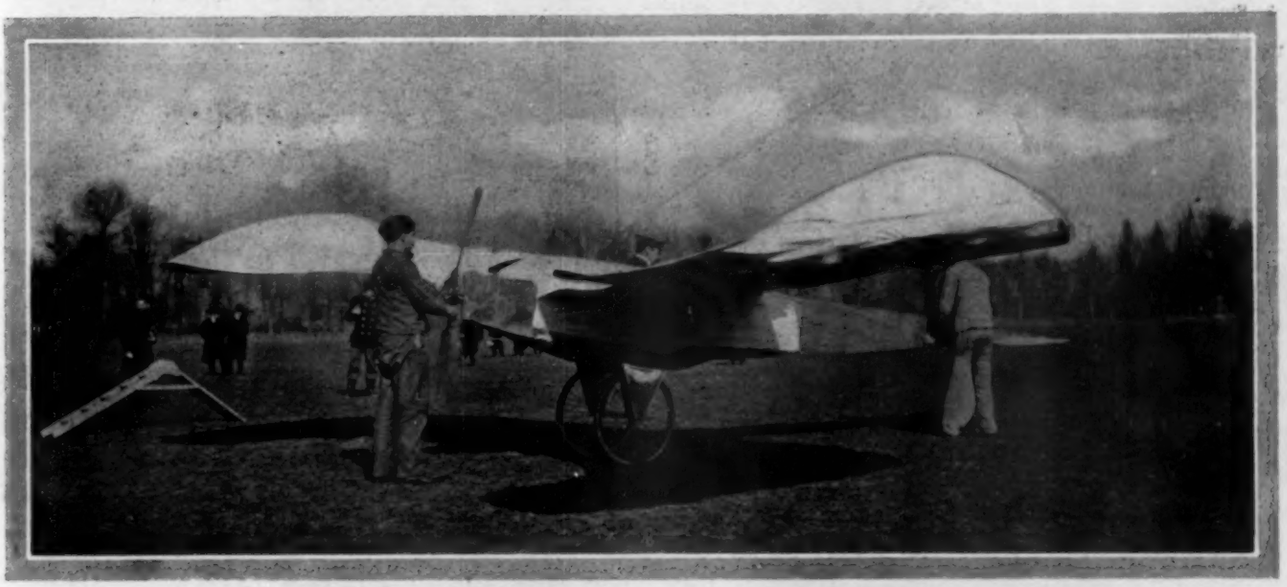
In the evening the Cleveland club gave a smoker to its members and guests, it being the largest gathering of automobilists ever gotten together in Cleveland. President Hotchkiss delivered another address in which he emphatically condemned careless drivers. He referred to the liberality of the speed laws in Vermont, where the autoist's judgment is taken into consideration, and stated that efforts would be made to enact similar laws in every State and to induce Congress to act upon the matter.

ABOUT THE STATEN ISLANDERS OF NEW YORK

ST. GEORGE, S. I., April 1.—At its meeting to-night the Richmond County Automobile Club decided to hold another dinner and run on April 28, and the new Terra-Marine Inn at Huguenot was selected as the destination. The entertainment committee, consisting of Emil H. Poehn, chairman; W. O. Sprigg, G. H. Waters, Charles A. Schultz, and J. J. Worrell, was requested to proceed with the necessary arrangements. At this meeting George H. Waters was elected a director to the New York State Automobile Association. A resolution was passed favoring federal and uniform automobile legislation which shall grant a national license to tourists and remedy some of the existing evils resulting from State legislation. A. B. Pouch and John Bittner were elected to membership.

AIR TOURISTS CONTINUE THEIR SPRING FLIGHTS

PARIS, March 27.—The return of Spring has brought the cloud brigade out of doors. Delagrange, Blériot, Vuia, and Santos-Dumont have all made experiments with their respective machines in the neighborhood of Paris. M. Blériot, of automobile lamp fame, has been busy all the winter on a new type of aeroplane, differing entirely from the one he used on the Lac d'Enghien last summer. It has a central frame on which is carried a 24-horsepower Antoinette motor driving a two-blade propeller in the rear and two wings modeled like those of a bird. The light framework is covered with parchment and is designed to offer very little resistance to the wind. The machine abounds in novel features thus, the two wings can be raised or lowered at will to facilitate turning, the two rudders placed in front may be operated either together or separately, and the two blades of the propeller can be driven either as one or independently at different speeds. The machine is mounted on a couple of bicycle wheels with efficient steel springs and a pneumatic cushion to prevent breakage when striking the ground.



THE NEW BLERIOT AEROPLANE LEARNING TO USE ITS WINGS ON THE BAGATELLE POLO GROUND, PARIS.

Unfortunately the initial trip was not a complete success. While traveling at a rapid rate the wheel supports broke and the apparatus collapsed. No serious damage was done.

M. Vuia, who has the honor of being the second man in France to fly on a heavier-than-air machine, has decided after several trial trips this week to abandon the carbonic acid motor in favor of an Antoinette of 24-horsepower.

After two or three unfortunate attempts to fly, M. Delagrange has met with success. The aeroplane built for him by the Voisin Frères has just covered a distance of about sixty yards in excellent style. Though still showing signs of too light construction, the aeroplane has proved that it is built on right lines. Santos-Dumont, who was present when the flight took place, heartily congratulated his rivals.

Santos-Dumont's Aeroplane Is Wrecked.

According to a *Herald* cable from Paris, Santos-Dumont completely smashed his machine in an attempted flight on the Saint-Cyr drill ground. For several days trials had been made to familiarize the pilot with the *Bird of Prey*, and finally an attempt was made to travel at the forty miles an hour necessary to raise the aeroplane from the ground. After covering half the length of the ground the machine swerved, bounced into a hole and was smashed in two. One of the wings was hopelessly destroyed. Santos-Dumont escaped without injury. He declares that he is not sorry the machine is smashed, for he was disappointed with the quality of the wood, which was much too brittle. Fresh material has been ordered and a new machine will be commenced to be fitted with the 100-horsepower, sixteen-cylinder motor now being built at the Antoinette factory.

French Gordon-Bennett Balloon Pilots Chosen.

Alfred Leblanc and René Gasnier have been appointed by the Aero Club of France as the national representatives in the Gordon-Bennett balloon race at St. Louis, next October. The third pilot will probably be selected towards the end of May. A delegate will be sent from the Aero Club of France to assist in the organization of the balloon race at St. Louis and the club has promised a gold medal to the pilot who succeeds in capturing the Bennett Cup for France. Alfred Leblanc is thirty-eight years of age, is a skilled hunter, skater and automobilist. He has made more than fifty balloon ascents in his balloons, the *Albatross* and the *Cythère*, and gained second prize in the Grand Prix of the Aero Club of France in 1906. He is also holder of the Gaulois long-distance trophy for a voyage from Paris to the Baltic. René Gasnier is an enthusiastic yachtsman, thirty-three years of age, who has sailed extensively in Eastern waters. He made his first balloon ascent in 1904 and is now the owner of three balloons.

WALTER WELLMAN'S VISIT TO THIS COUNTRY.

PARIS, March 27.—The members of the Wellman north pole expedition are completing the preparation of the balloon America, and will leave here shortly for Tromsö, Norway, whence they will depart for Spitzbergen June 1. The balloon, or airship, has been entirely reconstructed, has new motors, and possesses a lifting power of 19,500 pounds.

Walter Wellman, leader of the expedition, will in the meantime pay a visit to the United States. He is on board the *Kaiser Wilhelm II.*, which is due in New York on April 3. Replying to criticism to the effect that his airship had not been tried, Mr. Wellman declared that the America was built for arctic conditions and would undergo thorough trials at Spitzbergen. In the event of these being satisfactory the expedition would start for the pole at the end of July or the beginning of August.

JAMESTOWN AERONAUTICAL CONGRESS.

The Jamestown Exposition is having erected a special building to house the aeronautical exhibits. There will be balloon sheds and a hydrogen generating plant located conveniently in the aeronautic concourse. Coal and hydrogen gas will be supplied without cost to all contestants. A large number of applicants have already signified their intention of exhibiting aeronautic material of both heavier and lighter-than-air types. There will be cups and trophies for balloon and airship races and all sorts of competition. To Ernest La Rue Jones, No. 12 East Forty-second street, New York City, all inquiries should be addressed.

The following is the schedule of competitions between April 26 and November 30:

No. 1—Special race limited to members representing recognized aero clubs for club championship, May 4.
No. 2—Dirigible balloon competition, June 1.
No. 3—Competition of balloons for distance, June 15.
No. 4—Competition of balloons for duration, Aug. 3.
No. 5—Competition of balloons for objective point, Sept. 7.
No. 6—Competition of balloons for altitude, Nov. 16.
No. 7—Competition of balloons in pursuit of pilot balloon, Aug. 17.
No. 8—Competition of carrier pigeons, flight from Aeronautical Concourse, Exposition Grounds, May 18.
No. 9—Simultaneous release of large number of small balloons carrying messages, May 18.
No. 10—Flying devices heavier than air, with motor and operator, Sept. 14.
No. 11—Flying machine models with motor, Aug. 24.
No. 12—Flying machine models without motor, and carrying operator, Sept. 14.
No. 13—Kites for altitudes, Nov. 2.
No. 14—Kites for steepest angle of flight, No. 9.
No. 15—Kites carrying operators, Nov. 16.
No. 16—Registering balloons, July 13.
No. 17—Competition of balloons and automobiles. (Date to be coincident with the arrival of the Automobile Tour.)
No. 18—Competition of dirigible balloons and automobiles, May 25.
No. 19—Competitions of photographs taken from balloons or kites.
No. 20—Competition of photographs taken of balloons, aeroplanes or other aeronautical objects.
No. 21—Competition of photographs of meteorological phenomena. (Exhibits for No. 19, 20 and 21 to be ready April 26, and continuing on exhibition throughout the Exposition.)
No. 22—Signalling competitions with balloons or kites, Oct. 12.
No. 23—Hot air balloon competition, Oct. 5.
No. 24—Dropping (harmless) shells nearest selected objective point or target.
No. 25—Competition for longest trip, open during Exposition.

SWITZERLAND'S BALLOON RACE ENTRANT.

A communication has been received by the Aero Club of America from E. Messner, of Kewanee, Ill., applying to enter the Gordon Bennett International Aeronautic Cup Race. He is a pilot of the Aero Club Suisse and is writing to his club for permission to represent them in this race. The Swiss Club will, in turn, apply to the Federation for permission to enter. The entries having officially closed February 1, it would appear certain that the entry will not be accepted.

ELECTION OF THE FLORIDA EAST COAST A. A.

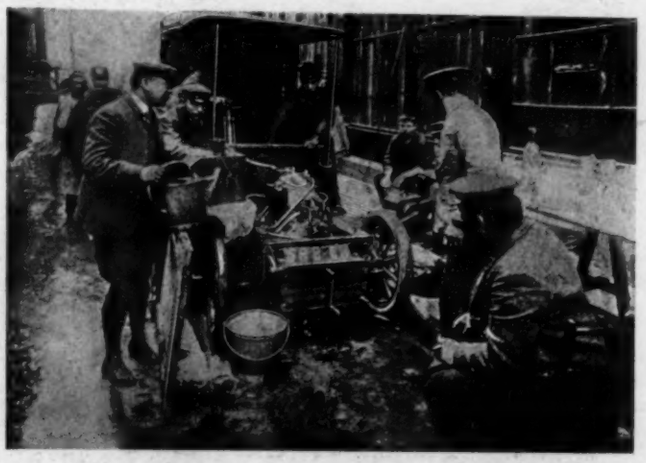
DAYTONA, FLA., April 1.—The annual meeting of the Florida East Coast Automobile Association, held recently, resulted in the selection of the following officers for the ensuing year: President, Major Foster; first vice-president, George Sebring; second vice-president, S. H. Gove; treasurer, Fred Conrad; secretary, T. Edward Fitzgerald; directors, Asa Paine, J. H. Allen, George H. Clark, J. B. Parkinson, E. L. Potter, N. A. Lewis.

Following the election a banquet supper was tendered by C. G. Burgoyne, the first president of the association, and he pleasingly presided as the toastmaster of the occasion. The speechmakers included W. J. Morgan, President-elect Foster, ex-President Paine, ex-Gov. Harding, of Ohio; Hon. J. B. Parkinson, Com. J. H. Allen, John Anderson, Mayor Green, Dr. Bennett, and several others.

AUTOS DRIVE PARIS NEWS PLANTS.

PARIS, March 20.—A prolonged wail of despair wafted heavenward—or elsewhere—when at 5 o'clock on Friday evening the electric lights of Paris went out as a result of the strike of the electricians. Householders shrugged their shoulders and thanked their stars that Paris apartments are still provided with gas or kerosene lamps. Theater managers closed their establishments and were philosophical. Newspaper men cursed loud and deep.

The first panic over, there was a rush for automobiles. Many an excited manager jumped into one of the numerous automobile cabs skimming along the boulevards and cried in feverish tones, "Panhard, Darracq, De Dion factory, and let her out as if the diable were on your heels." But the automobile factories which encircle Paris were closed for the night and gasoline-electric groups were at a premium. Commandant Krebs was closing his desk at the Panhard factory when a husky voice over the telephone asked if he could not send a portable plant to help the auto journal *Les Sports* out of its difficulty. Two gasoline-electric groups, each of 100 horsepower, were supplied, electric arc lamps similar to those used on the cycle tracks were obtained and one newspaper at least was saved from ruin. *L'Auto* had an Aster electric group in reserve which proved quite capable of running the lino-



DE DION AUTO PRODUCING PARIS NEWSPAPER.

types. In the newspaper quarter steam locomobiles puffed away all night side by side with gasoline delivery trucks and a smaller number of touring cars, all doing their best to furnish the electricity which the workmen denied. In one print-shop a 12-horsepower Darracq was raised off the floor, a rear wheel replaced by a driving pulley and belted onto the shaft of a linotype installation. Léon Bailby, who presides over the editorial destinies of the *Intransigeant*, brought along his De Dion automobile, ordered a dynamo, fixed the two in the street, belted them up and produced enough current to give the latest news to the public. The director of *Paris-Sport* owns a new 24-horsepower Hotchkiss which he used to drive a dynamo, smashing the body work to get the connection between the engine and dynamo with the recklessness of despair. Henry Fournier, who is now passing his time profitably selling automobiles to American and other millionaires in Paris, dismounted a magnificent 130-horsepower Itala motor intended for the Monaco motor boat meet, and gave it up to drive a dynamo.

In the Rue Royale, and on the main boulevards, the fashionable cafés were lighted with automobile searchlights, lanterns and candles. The costly headgear of a pretty Parisienne catches fire; the crowd laughs. Fournier passes too near the open exhaust of one of his big Itala engines and his silk hat is left behind for the ragpicker. Bravo, cry the ladies. The strike is fine fun for the boulevardiers, but newspaper proprietors are giving orders for gasoline-electric groups to be kept in reserve.

WHAT AUTO INVENTORS ARE DOING ABROAD

IT seems so long since the type of car that banged its way along with an unduly audible announcement of its coming was prevalent that the average autoist has forgotten the time when mufflers were such in name only, and the volume of sound did not vary greatly whether the alleged silencer was open or shut. In the same period, the motorcycle has not been improved

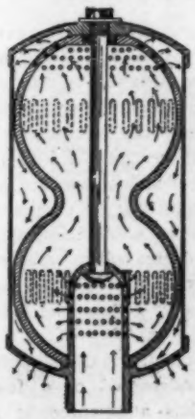


FIG. 1. Sharpe's Muffler.

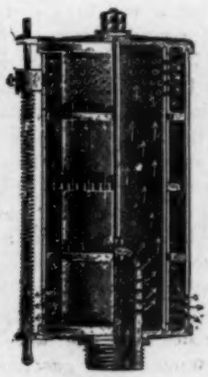


FIG. 2. The Universal Victoria.

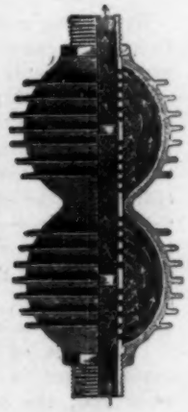


FIG. 3. The Universal Paragon.

perceptibly in this respect, and this constitutes one of the greatest drawbacks of the light power-driven two-wheeler from the public point of view. The layman cannot understand why the diminutive machine makes a fuss so disproportionate to its size and so much greater than that of its larger competitors. The Auto Cycle Club of Great Britain recently instituted a contest for improved devices of this kind, the awards in which have recently been made public. The chief considerations were back pressure, noise, facility of attachment, weight and strength, capacity, means of cleaning and maintenance, and cost. As will be noted from the illustrations, taken from *The Motorcycle*, the devices which gained the first three awards are distinguished by their simplicity. The first, shown by Fig. 1, is known as Sharpe's Universal Silencer; the second, Fig. 2, is the Universal Victoria Silencer, and the third, Fig. 3, is the Universal Paragon Silencer. The Sharpe is made of a seamless brass shell with two smooth aluminum bulbs; the Victoria consists of but two aluminum bulbs cast with flanges, while the Paragon consists of two annular concentric chambers and a series of perforated disks.

Another Entrant in the Shock Absorber Field.

Of the many anti-shock devices now on the market, those depending on the elastic force of compressed air hold certain advantages, says *The Car*. A useful apparatus of this type is the Amans, which is composed of a steel cylinder fitted inside with a piston worked by means of a chain passed over a small cog-wheel and joined to the axle of the car. The piston is formed of a cup-leather which, when pulled upon, presses hard against the cylinder walls and allows no air to escape past it. A small ball valve placed at one end of the cylinder enables air to be drawn in freely, and a suitable cap prevents wet and dust from penetrating. The body of the cylinder is fixed on to the frame of the car, and the working of the machine is as follows: When the car passes over an obstacle the springs give and the chain fixed to the axle becomes slack and allows the spiral spring in the cylinder to push the piston up to one end. The vacant space in the cylinder is thereby filled with air, and when the frame tries to return quickly into its place, this is compressed and offers a strong resistance which decreases gradually. When the chassis is in its normal position, the piston occupies the place shown in the sectional drawing, and a small by-pass allows the pressure to become equal on either side of the cylinder so that no action takes place.

Hydraulics Applied to Change-Speed Gear.

Although the application of hydraulics to the car is nothing entirely novel, as considerable attention has been paid to the matter of perfecting a hydraulic type of clutch, the latter power has not so far as known ever been utilized in the same manner as it is employed in the White patent speed gear, shown at the recent commercial vehicle exhibition in Olympia and described in *Motor* (London). It is designed along planetary lines and consists of a sunwheel carried on the tailshaft and planetary pinions supported by bearings in two plates bolted together on either side of the sunwheel, and fixed to the engine shaft. Outside one of these disks (on the engine side) there are small cranks attached firmly to the spindles of the planetary pinions, and used to drive the plungers of small oil pumps arranged symmetrically round the disk. Oil is sucked in through ball valves in the head of the barrels, and expelled through ports, the size of which can be controlled by an outside lever. According to the freedom allowed for the oil circulation, the speed of the tailshaft is regulated. When the engine is running, and the car not in motion, the oil pumps are permitted to work freely, and the planetary pinions revolve round the sunwheel without turning it. Directly the oil-outlet ports are partially closed the sunwheel commences to revolve at a slow speed, and the tailshaft obtains power to drive the car. The speed of rotation of the sunwheel increases as the pumps work more and more slowly, until, when these stop altogether, there is a solid drive right through. For the reverse a separate train of wheels is provided. There are certain disadvantages in the system. At slow speeds the power lost in friction forms a large proportion of the power developed, but as it is possible to run very largely on the direct drive the total loss will never amount to much, while it has the great advantage that the higher the speed the more efficient it becomes. A gear of this nature, flexible in the extreme, is a thing to be desired.

A New Self-Contained Distance Recorder.

Quite a departure in the shape of distance recording instruments is to be found in an English device which has been given

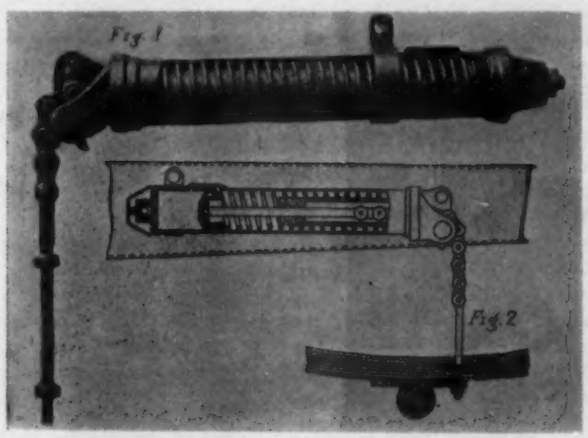


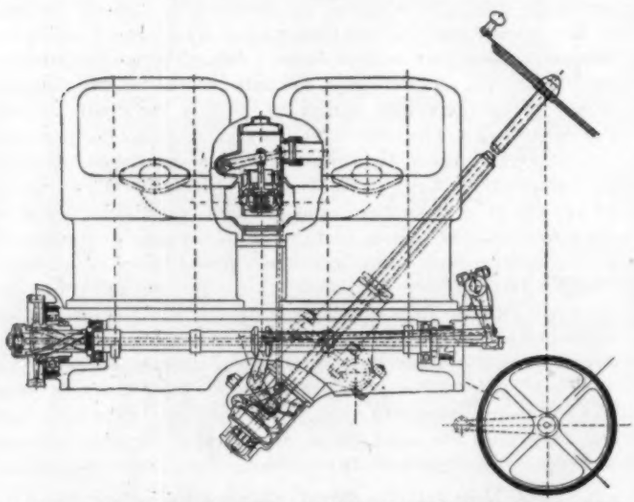
FIG 1.—The new Amans shock absorber; tube cut away, showing interior.
FIG. 2.—Sectional view, showing position and method of application.

the title of "Perfection" by its makers and is described in a recent issue of the *Autocar*. The recorder screws upon the hub of the front wheel in place of the ordinary axle cap and is applicable to any make of car. Without going into details of its mechanism, it will suffice to point out that its principle of work-

ing is based upon the fact that the axle of the wheel is fixed while the hub revolves. The mechanism consists of a pair of driving springs which engage with the nut at the end of the front axle. These springs are attached to a worm which drives the interior mechanism; consequently the instrument is entirely self-contained and positively driven. It is made in two patterns —trip and non-trip. Both give a continuous record up to 9,999 miles, but on the trip type there are two more dials which record up to 99 miles and automatically return to zero and recommence. This trip portion of the mechanism can be set back to zero at any time by a little button in the side of the instrument. Careful tests of the instrument extending over a considerable period and during the worst weather have shown it to be entirely accurate and dependable. Fractions of a mile are also recorded by the dial hand, which revolves once for every mile.

Device to Aid Use of Motor as a Brake.

As the result of the long-continued discussion that has been carried on pro and con regarding the advantages and the reverse of using the motor as a brake, during the course of which much of interest has been brought out, though more of absurdity has



THE SAURER MOTOR BRAKING DEVICE AS APPLIED AND OPERATED.

resulted, a Continental inventor has brought forth a device to enable the motor to be utilized as a brake, which is described in *La Suisse Sportive*. It permits of varying the passive resistance of the motor to an extent equivalent to that of its rated power, and consists of a method of regulating the compression of the air that is taken in. This is done by taking pure air through the carbureter and by delaying the opening of the exhaust valve. Under ordinary conditions no braking effect is gained from the compression alone, as it is offset by the subsequent expansion; but if the exhaust be advanced, say 90 degrees on the crank circle, part of the compression is utilized in retarding the revolution of the shaft, the rest escaping. The sooner the exhaust valve opens, the sooner it closes, that is to say, before the upper dead center, and in consequence a certain amount of air is compressed and then released before its expansion imparts any power to the motor, so that the work represented by its compression is entirely absorbed.

To obtain the maximum braking power, the exhaust may be opened during the course of an explosion and the four parts of the cycle then become as follows: (1) Inspiration through the open air valve; (2) compression, all valves closed; (3) opening of exhaust valve at upper dead center and escape of compressed air; new inspiration of fresh air at atmospheric pressure through exhaust pipe; (4) compression, all valves closed; (1a) opening of admission valve at upper dead center and escape of compressed air, new inspiration of air at atmospheric pressure; (2a) compression, all valves closed, and so on. In consequence, each piston on its upward stroke furnishes an amount of resistance equivalent to the power required to compress the air in the combustion chamber, and none of this effort is returned to it by expansion on the down stroke. The amount of braking effort thus produced may be regulated at will; this is done by the driver by means of a small lever mounted on the steering wheel, as shown by the accompanying illustration of the device as applied to a motor.

PRICE OF GASOLINE STIRS EUROPE.

Europe has real fears that the price of gasoline will increase to such an extent that it will be a costly matter to satisfy the moderate appetite of a modern motor. The situation is not yet alarming, but there has been a steady increase in the price of gasoline during the last eighteen months, which, if continued, might lead to a serious situation. From 28 centimes a liter in the middle of 1906, the average price in France increased to 30 centimes at the end of the year and now stands at 34 centimes, the highest price since the beginning of the automobile industry in 1900. The profit of the retailer has decreased in greater proportion than the increase in price, a retailer who formerly made a profit of two to three dollars on a 22-gallon sale now gets but 50 or 60 cents.

The reason of the increase is readily found. Automobiling has increased in proportions that were undreamed of a few years ago; the consumption of gasoline has augmented at a ratio altogether out of proportion to the increase in the consumption of auxiliary products such as kerosene and lubricating oils, so that gasoline, which was once a minor product, owing to the small demand, is now the principal object of refining.

In France there are four large refineries at Rouen, three at Bordeaux, two at Cette and one each at Havre, Douai, Cateau, Roubaix, Lille, Bonnières, Colombes, Aubervilliers and Marseilles. These together produce roughly 1,760,000 gallons of gasoline per annum. The rest has to come from abroad.

The United States is not only the largest producer of petroleum, but the greatest exporters of gasoline. The following table shows the world's production of petroleum from 1903 to 1905, the figures being barrels of 35 gallons each:

	1903	1904	1905
United States	100,400,000	118,000,000	114,700,000
Russia	75,500,000	78,500,000	54,900,000
Straits Settlements	6,600,000	6,300,000	7,700,000
Galicia (Austria)	5,200,000	5,900,000	5,700,000
Roumania	2,700,000	3,600,000	4,400,000
India	2,500,000	3,300,000	4,100,000
Other Countries	2,240,000	2,620,000	2,730,000

According to *La Vie Automobile*, the United States cannot continue to supply foreign countries with gasoline as she is doing at present. Automobiling is developing at such a rapid rate that in a few years Americans will consume their entire output of gasoline. This is certain from the fact that the American petroleum springs are not rich in hydrocarbon. Russia, another large producer, is in the same position as the United States; with the exception of one district of little importance, Russian petroleum produces only a small percentage of gasoline.

Roumania plays an important part in the production of gasoline, certain of its petroleums producing as high as 60 per cent. of gasoline by distillation. The exportation of gasoline from Roumania has increased in a notable degree: 29,563,572 hecoliters in 1903, 50,351,778 hecoliters in 1904 and 62,696,098 hecoliters in 1905. Of the 1905 production, 37,276,578 hecoliters, more than half the total production, was sent to France.

With the exception of Roumania, which, despite its rich wells cannot claim to supply the world, the demand for gasoline increases at a much more rapid rate than the demand for other products of mineral oils. Thus it is quite possible that, even with an almost unlimited petroleum supply, there may some day be a gasoline famine.

HOW THE MAGNETO IS UTILIZED FOR IGNITION

By CHARLES B. HAYWARD.

IN recent issues of THE AUTOMOBILE the various sources of electric current for ignition, as employed on the car, have been touched upon generally, and the why and wherefore of the dry cell and the accumulator dwelt upon at some length. The latter are the only chemical means of producing a current employed for the purpose on the automobile, the remaining class

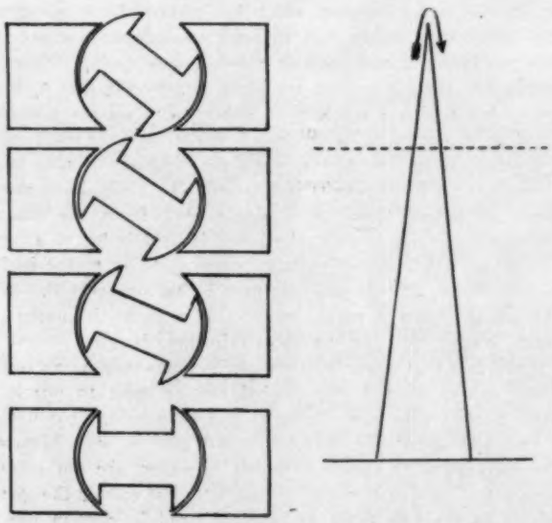


FIG. 1.—Illustrating cycle of an alternating current.

of current producers being purely mechanical, such as the small direct-current dynamo and the magneto. It is intended to take the latter up in the present article. Before doing so it may be as well to correct what appears to be a prevailing impression on the part of a very large number of autoists that the magneto is something of comparatively recent origin, which is finding itself in the first stages of its development on the automobile. How erroneous this is need hardly be called to the attention of those who are at all familiar with the past history of mechanical means of generating an electric current. Far from being a late development in this field, the magneto represents one of the earliest steps in the evolution of the alternating-current generator, but unlike so many other devices which have lost all semblance to their original in the course of improvement, the magneto is the same to-day fundamentally as it was when first invented. Probably the field in which it has met with the widest acceptation is that of telephony, where it has served faithfully for more than a score of years.

How Magnetos Differ.

There is another point that has proved extremely puzzling to a very great many autoists who are not familiar with electric machinery, and that is the real distinction between the low and high-tension types of magnetos. This arises principally from the fact that to a certain extent the terms are interchangeable. To start with the rudiments—and a clear conception of the matter can be gained in no other way—it will be well to recall what has already been given in the general outline of the magneto in a previous issue of THE AUTOMOBILE. That is, the nature of its components—a permanent magnetic field and a Siemen's or H-shaped armature. In what may most aptly be termed the true low-tension type, the wire on the armature consists of but a single winding, and usually with comparatively few turns of rather coarse wire, as the voltage required is low. Its sole remaining essential consists of the current-collecting apparatus. As has already been explained previously, the current generated is alternating and rises and falls twice during every revolution of the armature; at a certain point in each half turn the current reaches its maximum value or peak, and it is at these points that it is desired to utilize the current for ignition. By maintaining the armature winding short-circuited until these points are reached, the value of the current is still further enhanced when the circuit is suddenly opened. This is done by a mechanically operated circuit breaker, usually a cam fastened to the armature shaft itself, the latter being timed to coincide with the occurrence of the point of ignition in the cylinder.

But by adding a single essential the magneto just described may be readily converted into what has erroneously come to be termed a high-tension magneto. Instead of using the current for ignition as it comes from the magneto, it is sent through an induction coil, or step-up transformer, and raised to a high potential. It is then used in connection with the regulation jump spark plugs instead of with mechanical ignitors, as are necessary in the former case, so that what is commonly known as a high-tension magneto is merely one of the low-tension type with an induction coil. Technically speaking, it would be just as correct to term an accumulator low tension when used with an ignition system of this type and high tension when used with the latter. However, it is difficult to find a term that expresses the characteristics of the magneto in question in a word or two, and popular usage calls for short and easily remembered names, so that this one has stuck. Where one wishes to be explicit in the matter, it is sometimes referred to as "high tension, with coil." The Eisemann and Remy are familiar types.

The difference between this and the true high-tension magneto may most readily be explained by stating the latter incorporates an induction coil in its make up. The armature winding already referred to is made to serve as the primary winding of the coil besides performing the function of generating the current. A condenser completes the transforming part of the apparatus, the current collecting and circuit breaking devices remaining the same—that is, in principle, as they naturally differ materially in the various makes of machines on the market. However, it is

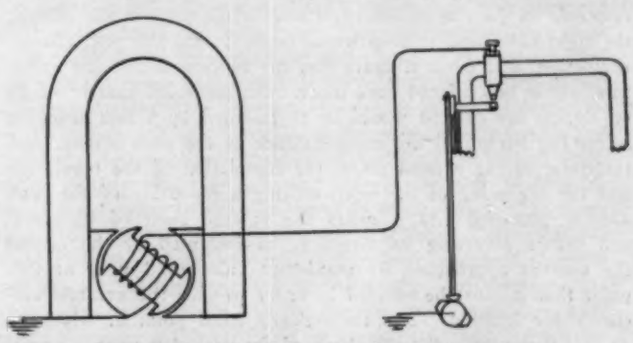


FIG. 2.—Simplicity of the wiring of low-tension systems.

not intended to go further with the description of the high-tension system at the moment, as this will be gone into more at length later on and in a separate article. The low-tension magneto was the stepping stone in this field and hence will be taken up first.

Characteristics of the Current.

Just how the magneto generates an electric current has already been explained at some length in a previous article, and need not be recalled here further than to bring to mind the fact that, if provided with the usual collector brushes, it would deliver an alternating current constantly as long as turned, as is the case when the crank of a telephone magneto is turned. As the

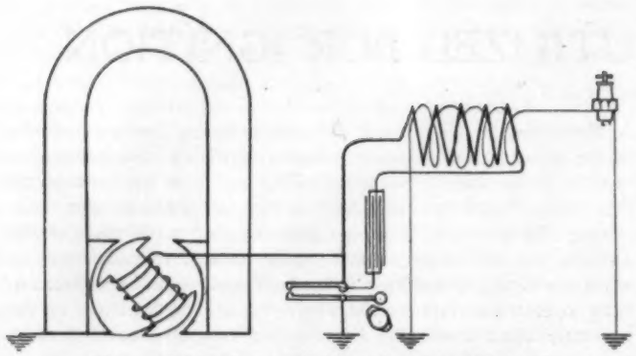


FIG. 3.—Wiring diagram, "high-tension-with-coil" system.

four-cycle, four-cylinder engine only requires two sparks per revolution for ignition, it is desired that the peak of the alternating current should coincide with the occurrence of these sparks in the cylinder in order to utilize the maximum value of the current at as low an r. p. m. rate of the magneto as possible. A slight digression is doubtless in order here to render clear exactly what is meant by the *peak* of the current wave and the reason for terming it thus. As its name indicates, an alternating current is one that surges back and forth, alternating in direction constantly. These pulsations are termed cycles, and large machines in power plants are wound to give anywhere from 25 to 100 or more cycles per second, known as the *frequency* of the current; this is so high that in electric lighting no flickering whatever is apparent, but when reproduced by a recording instrument they appear as a series of peaks rising and falling to the same distance above and below a horizontal line, which may be termed an "electric dead center." In Fig. 1 the magneto armature is shown in positions corresponding to the rise of the current during one-quarter of its revolution; in the first position it is on the center referred to, corresponding to the horizontal line or beginning of the peak, and with its revolution the current line rises, increasing in value, except that the number of steps or gradations are infinitely greater than the few indicated.

How Time of Ignition Is Altered.

The quarter revolution of the armature shown only corresponds to the rise or left-hand side of the peak in the sketch; the right-hand side or drop would occur during the next quarter revolution, and when it again met the horizontal line the armature would be centered once more. On the third quarter of its revolution the current would be represented by a line dropping below the horizontal the same distance as the peak shown, and, returning to the neutral point, the completion of the revolution and the beginning of the next, making a repetition of the peak already pictured. As it nears the upward limit of its travel and before reversing its direction, as indicated by the arrow, the current approaches its maximum value, and it is at this point that it must be utilized in order to give the greatest efficiency for ignition. The theoretically ideal point at which to do this is naturally the actual top of the peak, but as it is necessary to provide for both advancing and retarding the time of ignition, this cannot always be done. In consequence, provision is usually made to rotate the armature through part of a revolution by hand and independently of its drive, or the time at which the primary circuit is opened is altered to correspond; in some high-tension systems, such as the Bosch, this is accomplished by altering the relative position of the secondary distributor. The effect of this is to take advantage of the current either when just approaching the point of maximum value or when receding from it, as indicated by the dotted lines drawn across the upper part of the peak. As the intensity of the magneto current increases proportionately with the speed of the engine, there is usually found to be less necessity for advancing the time of ignition to the same extent as with the battery, but current practice in magneto design allows a liberal amount of leeway in this respect, without impairing in any way the efficiency of the machine when working at either extreme.

The Different Systems Compared.

In order to render as clear as possible the fundamental differences between the low tension and the true high-tension types of magnetos, the accompanying simple sketches have been prepared. As its name indicates, in the low-tension type the current is used without being put through any preliminary process of transformation, in contrast with either of the high-tension systems, the difference between which has already been referred to. In the latter it is either sent through an independent induction coil or the latter is embodied in the magneto itself. The essentials of a low-tension system are illustrated by the sketch, Fig. 2. There is but a single winding of coarse wire on the armature; one end of this winding is grounded in the machine itself, which also grounds it on the motor when the magneto is attached to the latter, as no insulation is interposed. This simplifies matters to such an extent that but a single lead from the magneto constitutes the entire wiring; the latter is usually led to a copper bar, to which are attached switches corresponding to the ignitors of each cylinder, so that any one may be cut out at will. When the switch is closed it makes connection with an insulated plug inserted in the cylinder, as shown in the drawing.

It is the fact that some high-tension systems employ an outside coil and others do not that probably does most to puzzle the amateur autoist who likes to figure out such things for himself. The essential difference between these two is well illustrated by the accompanying sketches, which, however, are not intended to picture any particular make of magneto, but merely the general principles of the two types as manufactured in current practice for ignition purposes. Fig. 3 shows what may most correctly be described as "high tension with a coil." In order to simplify the wiring to as great an extent as possible, one side of practically every circuit is grounded as there shown; the condenser, indicated by the interlocking lines and connected across the primary circuit, being incorporated with the coil. For greater clearness, but a single plug is shown; in actual practice a distributor on the magneto itself and run at half speed by gearing is employed. The working of the primary and secondary is thus synchronized, the segment corresponding to one of the plugs passing under the distributor brush at the same instant that the primary circuit is opened by the contact breaker.

In Fig. 4 is illustrated the principle of the true high-tension system, of which the Bosch is one of the earliest and best known representatives, one in which the magneto itself generates a high-tension current directly and without the interposition of any auxiliary devices. The winding proper of the armature also serves as the primary of the induction coil, the secondary of which is also carried on the same core. The condenser is likewise embodied in the machine itself, thus making it entirely self-contained. Wherever possible, one side of each circuit is grounded, as mentioned in connection with the foregoing type, and the secondary current is distributed in much the same manner.

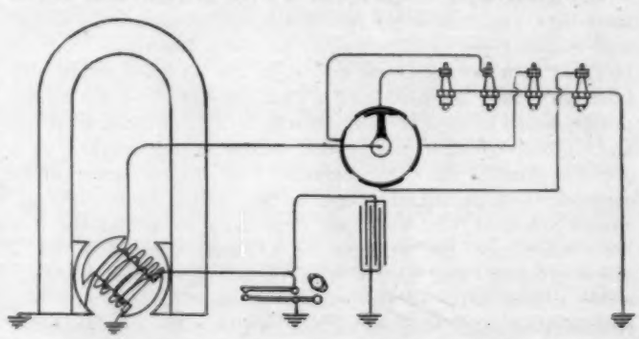


FIG. 4.—Wiring diagram of true high-tension system.

LIMITS OF THERMAL EFFICIENCY IN MOTORS*

By DUGALD CLERK, C.E.

THE Institution Committee on the Standards of Efficiency of Internal Combustion Engines, among their recommendations as to the standard engine of comparison for internal combustion motors, recommended that for the purpose of the standard, air—assumed to be a perfect gas having a value of $\gamma = 1.4$—should be taken as the working fluid. For the ordinary four-stroke cycle engine the formula giving the efficiency then was

$$\eta = 1 - \left(\frac{1}{r}\right)^{0.4}; \text{ where } \frac{1}{r}$$

was the ratio of the minimum volume to maximum volume. The committee were satisfied that with good engines, giving their best economy, the actual efficiency divided by the ideal efficiency determined by this standard could be expressed by a ratio which varied between 0.5 and 0.7. This was deduced from separate tests made by Professor Meyer and Professor Burstall. Professor Burstall's tests also showed how inefficient design would decrease the ratio, as in some of his tests means involving greatly increased cooling surfaces were employed to increase the compression, and were found to considerably diminish the ratio. These tests showed further how too high flame-temperature also decreased the ratio. The committee required, however, further knowledge as to the effect of the dimensions of the engine on the ratio, and accordingly they made tests on three engines of 5 inches, 9 inches and 14 inches diameter cylinders respectively, giving 6 i.h.p., 24 i.h.p., and 60 i.h.p. In these engines, taking the mechanical efficiency to be 88 per cent, and calculating the indicated horsepower from brake horsepower, they found that the efficiency ratios were 0.61, 0.65, and 0.69 in the three engines.

Difference Between Large and Small Engines Slight.

The tests showed, therefore, that by bearing in mind the slight changes in the ratio due to differences in dimensions, a close approximation to the best indicated efficiency to be expected from a given compression could be obtained by the use of a factor varying between 0.60 and 0.70, according to the dimensions of the engine. The tests also showed very clearly the small increase in economy of large engines in comparison with small ones, there being only 12 per cent. increase between 6 horsepower and 60 horsepower. The possible efficiency with the actual fluid used in the engine was known to be less than that given by the air standard. The committee considered that a definitely known standard from which the actual efficiency could be deduced by using a multiplier found experimentally, allowing for the imperfections of the engine as well as for variations in the properties of the working fluid, should be adopted until the properties of the working fluid were accurately known. Mr. Clark said he had examined the results of the test made by the committee and had made some further experiments on the large engine used in the test, with a view to finding the true heat distribution in the engine. The balance sheet given by the committee was as follows:

	L.	R.	X.
Exhaust waste	35.3	40.0	39.5
Jacket waste	23.5	29.3	25.0
Radiation	7.6	10.0	7.3
B.H.P.	26.7	28.3	29.8
	93.1	107.6	101.6

Every Factor Must Be Considered.

In obtaining this balance sheet the exhaust waste was determined by calorimeter, jacket waste measured, and the radiation includes friction of the working parts. The brake horsepower was determined by rope brake. In order to reason as regarded properties of the working fluid, it was necessary to know the indicated horsepower, the loss of heat during explosion and expansion, and the heat in the gases at the end of expansion. These quantities were not given in the ordinary balance sheet, as determined above. In the ordinary test the jacket loss was always over-estimated, because some heat which ought to go to the exhaust calorimeter flowed to the water-jacket after the opening of the exhaust valve and all through the exhaust stroke of the engine. The piston friction also would appear in the water-jacket. He had, therefore, attempted to adjust the balance-sheet from data given in the committee's report. Taking the mechanical efficiencies for the three engines, L, R and X, as 0.84, 0.85 and 0.86, the friction percentage of total heat was 5.1, 5 and 4.9 respectively. Deducting this from the jacket waste, corrected values for heat to water-jacket, 21 per cent., 26.8 per cent. and 22.6 per cent. were obtained. Using these values, and reducing to percentage, assuming that the error in total heat was not in the indicated horsepower item, a new balance sheet was obtained:

	L.	R.	X.
Exhaust waste	41.1	37.1	39.9
Jacket waste True radiation	27.1	29.6	25.4
I.H.P.	31.8	33.3	34.7
	100.0	100.0	100.0

Maximum Possible Efficiency Calculated.

The ideal efficiencies in these engines were practically the same, and assuming that one-third of the heat going to the engine was converted to work, and that the heat loss occurred near the beginning of the stroke, the difference between the jacket plus radiation losses in any two engines should be three times the difference between the indicated horsepower. In the L and X engines this was found to be exactly the case. The jacket waste in the L engine was evidently too low, and on the above considerations should be 34.1. This value of jacket waste for the L engine would give an exhaust waste of 34.1, which was practically the same as that determined by calorimeter. It appeared, therefore, that in the L engine some heat which should have appeared in the water-jacket had been lost. This corrected balance sheet was probably more accurate than that obtained in the test; but there was still some heat found in the water-jacket which should be in the exhaust. The experiments gave no means of determining the amount. The balance sheet, however, gave a method of calculating the maximum possible efficiency of the actual fluid. Adding exhaust waste to indicated horsepower, and dividing indicated horsepower by the sum, possible efficiencies for the three engines of 0.482, 0.473 and 0.465 were obtained. In obtaining these efficiency values, however, it had been assumed that the heat was lost at the beginning of the stroke, and therefore the values were not accurate. If the distribution of heat loss were known, the true adiabatic could be constructed and correct results obtained. To check the results, indicator diagrams which gave the correct mean pressure have been studied. From the composition of the exhaust gases and the charge temperature, the weight of the charge was found to be 0.14 lb. From the diagram the temperature drop from the end of expansion to charge temperature was 1,745° F.

The specific heat of the gases by weight, assumed constant, was 0.185. From these values, obtained from the numbers given in the committee's report, it appeared that 43 per cent. of all the heat of the combustible gases was accounted for in the exhaust. This gave a balance sheet for the X engine:

	Per Cent.
Exhaust waste	43.0
Jacket waste and radiation	22.3
I.H.P.	34.7

*Paper read before The Institute of Civil Engineers, London.

The exhaust waste here would obviously be greater if specific heat increased with temperature. From this balance sheet, calculated as before, an efficiency of 0.447 was obtained; with air, the efficiency would be 0.49. These considerations showed the difficulty in using the actual fluid as a standard. In spite of the great labor expended on the experiments, only a rough approximation to the true heat distribution could be arrived at. In 1884 he had made experiments on cooling after explosion in a closed vessel. Many other investigators had since done similar work, but cooling of a cylinder having a moving piston had never been investigated. He made further experiments, and determined the cooling in the X engine. The engine was run at normal speed, and when a charge had been drawn in, the rollers actuating the inlet and exhaust valves were slipped, so that the valves remained shut. The explosion then took place, and the gases instead of being discharged were alternately compressed and expanded. An indicator card gave a cooling curve, showing temperature fall during successive revolutions of the engine. From these cards the mean apparent specific heat of the gases in the cylinder had been deduced, the gases being practically the same composition as those in the committee trials.

The value given increased with increase of temperature, and had been called apparent specific heat values, because certain facts discovered were inconsistent with the change being entirely specific heat change. Calculations, assuming these numbers to be the true specific heats, were, however very nearly accurate. From the cooling curves and specific heat values so determined a balance sheet had been obtained for the X engine as follows:

	Per Cent.
Heat flow during explosion and expansion.....	16.1
Heat contained in gases at end of expansion.....	49.3
Indicated work	34.6

Efficiency of 88 Per Cent. Shown.

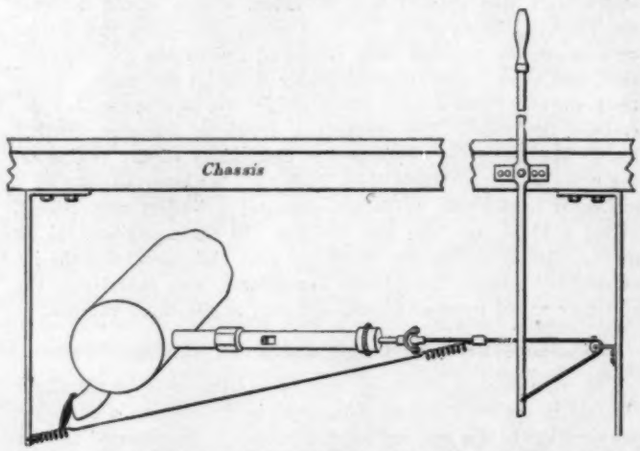
Comparing this with that found by the committee, it was seen that the indicated work was the same in both. There was, however, less heat flow during expansion, and more heat in the gases at exhaust. This showed that about 21 per cent. of the heat in the gases at the end of expansion went to the water-jacket during the opening of exhaust valve and exhaust stroke. This was considered a more accurate balance-sheet than had yet been obtained. Calculating the ideal efficiency as before, the value 41 per cent. was obtained. From the values of specific heat given, the adiabatic might be calculated, from which the ideal efficiency would be found to be 39.5 per cent., showing that the actual engine had converted 88 per cent. of the heat which it possibly could convert into indicated work. The new method had been checked by a test of a small Stockport engine in his laboratory, which gave similar results to those given by the X engine. Tables had been calculated showing the ideal efficiencies for different compressions using the specific heat values given, and showed that roughly the air standard was 20 per cent. too high, and that if gamma be taken, 1.285 for the explosion line, and 1.37 for the compression line, the change of specific heat between 1,700 degs. C. and 1,000 degs. C. commonly used in practice was too small to produce much error. More investigation was, however, required before even the apparent specific heat values could be accurately known for the various mixtures used in internal-combustion motors. Much had been recently done, including experiments by Professor Hopkinson, Messrs. Bairstow and Alexander, and Professor Burstall; but until further knowledge was obtained, the air standard, as defined by the committee, gave the best basis for comparing the performances of different engines. Appendices to the paper showed the method of calculating the suction temperature, charge temperature, exhaust temperature and charge weight, and also the method of calculating the adiabatic and efficiency for varying specific heats.

[Ed. Note.—The data which the author has been able to compile as the result of the numerous experiments and investigations undertaken will doubtless be found of considerable value, particularly as it comes from an authority of such high standing.]

THE "NIGHTINGALE" AUTOMOBILE WHISTLE.

It is said that the sirens of ancient times were possessed of pleasing voices; in fact, one is given to understand that they sang as attractively as the chorus at the opera, says *L'Automobile*. The sirens placed on automobiles are, on the contrary, like their larger brothers, the steam whistles used on large vessels—organs strident and raucous, whose working is absolutely disagreeable to sensitive nerves. So far as automobile whistles are concerned, they also have the serious defect of being a torture to the ears. The development of these warning instruments should accordingly take the form of an attempt to make them more musical. We have seen the evolution of the trumpet to four for horns, on which may be placed, if not music, at least all the cavalry calls.

To remedy this state of affairs a Parisian house has just brought forth a very simple apparatus which has been christened the nightingale. It is a whistle designed to be blown by the exhaust, the note produced being varied at the will of the chauffeur. As will be plain from the accompanying line sketch of the device, it consists of a cylinder and piston of brass tubing, attached to the muffler of the car, while the protruding end of the piston rod at the other is connected to a cable. Attached to the same cable are two helical springs, the function of the first or right-hand one shown being to keep the piston in its normal position, which corresponds to the extreme end of its outward stroke, the hand lever acting against the spring to draw it out. The second spring shown at the left-hand side of the sketch, normally maintains the escape pipe from the muffler open, being attached at one end to a bracket and at the other to a clapper or cover for the pipe. When pushed forward the lever also draws against this spring and closes the lever at the same moment as the whistle comes into action. In the brass cylinder itself, or body of the apparatus, there are a number of holes, through which the exhaust gases pass to produce the sound. Varying the number of these explains the method used of obtaining a modulated sound, which may be sharp or very deep, depending upon the part of the cylinder the piston is drawn to at the time. The principle is that of the wood and cork whistle, which all of us have had more or less experience in making in the happy days of our boyhood, and the device itself is as simple and easily operated as those shrill toys which required nothing more than a penknife and a modicum of skill for their manufacture. Of course, considerable more study has been devoted to the design as well as the size of the parts, not to mention the materials that enter into the composition of this latter-day boy's whistle, for such it will doubtless prove in the hands of many a chauffeur. It is a signalling device that has the merit of novelty and one which permits the operator to vary its warning note at his pleasure by producing sounds that are more or less harmonious, but which at least will be less disagreeable than the voice of the average siren—something that should not be difficult.



HOW "LE ROSSIGNOL" IS MOUNTED AND OPERATED FROM THE SEAT

THE IMPORTANCE OF FACILITIES IN TOURING

By THOS. J. FAY, E.E.

IT is nearly as disconcerting to possess the car and nothing besides as it is to be in the fix so often described, viz., "to have everything but the car." Indeed, it is one thing to go for a ride on occasions, but it is quite another matter to tour at length in cars as they are usually found, affording, as they do, barely room enough for one's feet—if perchance the feet be not to fit the boots of one Dexter Penasus—outside of the seats.

That touring cars are rarely ever suitable for touring is a fact so thoroughly established that no one takes the trouble to wonder at the entire absence of even the conveniences that might possibly go with a 6x9-foot flat in the district of the "great unwashed." That so barren a thing as a car so full of machinery that it will hold nothing besides is a necessity is proven by the demand for such cars; but that a remedy for such a state of affairs may not be arrived at is too ludicrous to think about for even a single moment.

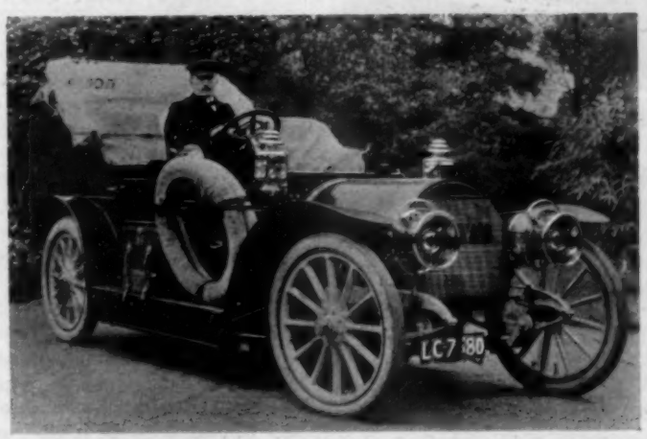


FIG. 1.—Car completely and comfortably equipped for the tour.

As a matter of fact, body work has been more or less a bungle, left to its own devices or in the hands of bodymakers who, for the most part, miss the "dashboard" and say "giddap" through force of habit; all because "automobile engineers" are busy on the chassis and have but little, if any, time to devote to the design of the body. That this state of affairs can go on forever is scarcely to be believed; moreover, autoists are not the class of men to take kindly to continued neglect. Of course, bodymakers are drifting away from the old carriage makers' practise, apace at any rate, although it must be said 'tis a slow motion, just as "drifting" always is. In the meantime the most enthusiastic of the autoists are doing for themselves "quite nicely, thank you."

The bodymakers as a class find themselves in a passing strange predicament, for while they are condemned for making bodies heavy, they are censured for not affording space for luggage; and again, the question of "art" or appearance, like a hungry coyote, barks incessantly and presses hot-footed on the trail. Back of all of these questions is the great matter of filling orders that seem to tumble over each other in a mad concourse, as if indeed the world must soon come to an end and everyone wants a body in which to tuck his soul.

Bodymakers are therefore in the odd position of being able to market anything that looks like a body at double the true value of a serviceable body, and so, it must be confessed, they (the bodymakers) can scarcely be expected to do more than "make hay while the sun shines," which is probably what they are doing.

There are, of course, a few specialists who devote their time and their skill to fine bodywork, and it is to them the experienced autoist goes in quest of bodywork such as will serve a useful end. Such bodymakers do very little, if any, of what might be termed "stock" work, but the product of their establishments is said to be "special," for what reason none can tell, for in all fairness these so-called "special" bodies are barely good enough for so-called stock cars. This is not to say the special bodies are inferior, but it is to say the inferior bodies should have no standing at all and the special bodies should be classed as regular. Special bodies are so very costly, primarily because they are special, and the word implies a license to charge a special price; and again, building but one body of a kind is sure to end in a far higher cost than that which should obtain were bodies duplicated a hundred or say a thousand-fold.

The illustrations accompanying this article are offered as affording an inkling of what an ambitious autoist can do by way of providing comforts and keeping things "under cover."

Fig. 1 shows the car, ready for the road, all neat and trim, with the "chauffeur" on the job. Viewing the car as it stands it is easy to note a tool box under the running board, an extra front and hind shoe on the running board, as well as a fairly commodious "packer" just back of the shoes, but free of the side

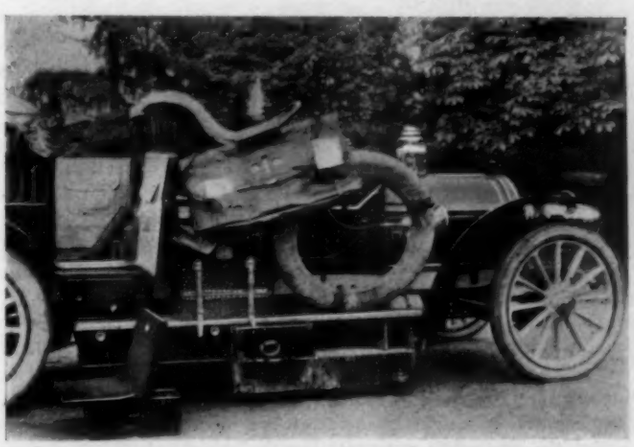


FIG. 2.—Showing the commodious and subdivided tool box.

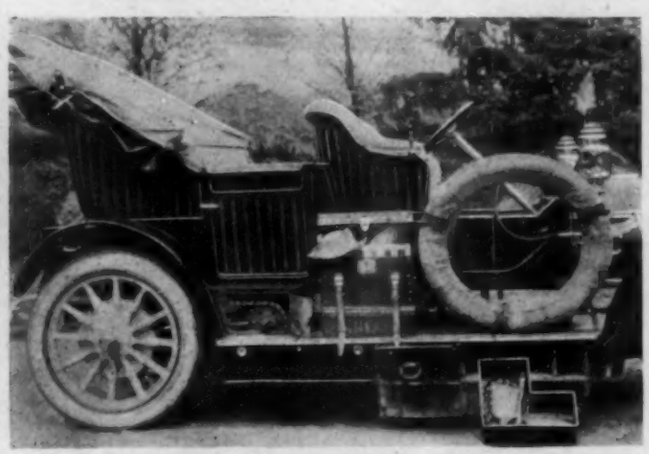


FIG. 3.—Interior of packer beneath running board exposed.

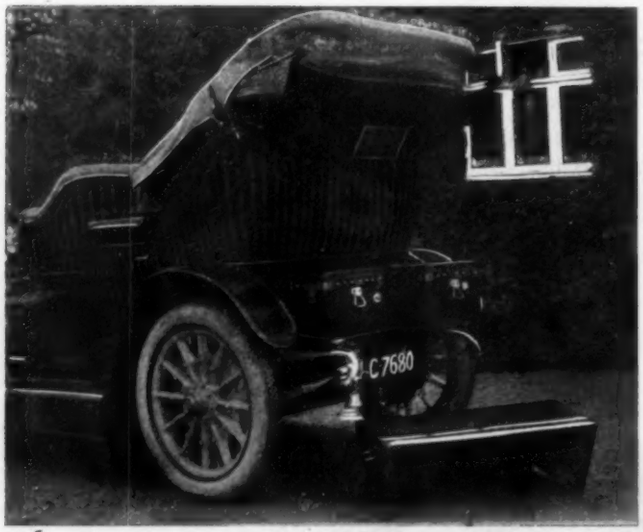


FIG. 4.—How space under rear seat is utilized to advantage.

entrance. The opposite side of the car has also a tool box under the running board, as well as a "packer," but no shoes, since, on the right side an entrance to the driver's seat must be held untrammeled.

Fig. 2 again illustrates the same side of the car, but with the drawers forming the tool box under the running board opened up to view, thus disclosing a very commodious, sub-divided space for necessities. In this figure it is plain to note that the side entrance door is not interfered with by the "packer" on the running board, and a glance at Fig 3 will disclose the open "packer" and the use to which it is put.

This view also shows the side chain of the car open to view and an extra chain in the drawer pulled out from under the running board. The autoist thus suggests that an extra sprocket chain is an article of merit, if not a necessity.

Fig. 4 shows how the space under the rear seat is utilized, which space is made to hold two very commodious packers, and the hood or cover on the ground is made to fit closely over the space, thus rendering the hiding place for the packers proof against the weather, besides holding the artistic effect of the car intact. This view also discloses a packer half drawn out—to the side—from under the front seat, besides giving an excellent view of the chest of drawers under the running board on the left side of the car. Fig. 5 shows the two packers on the ground—out of the rear pocket—and the packer half out from under the front seat, while Mr. Ellsworth—to whose ingenuity the whole arrangement owes its origin—serenely views the scene.

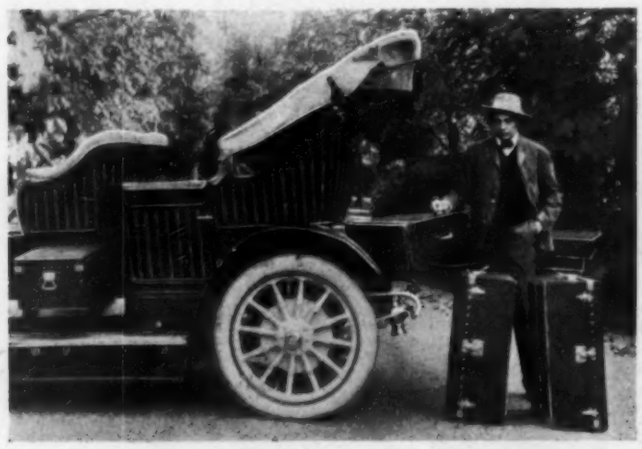


FIG. 5.—Commodious rear seat packers exposed to view.

It seems simplicity itself to thus arrange a car and so provide a considerable storage space for touring necessities, but there are many details to take into account. First and foremost, there is a limit to the weight to be borne by tires, and, again, the limit is nearly reached ere any provision is made for the storage of anything. It follows, then, that packers and all such means of storage must be very light, yet ever so strong, for they are bounced about incessantly.

It will also be understood that doors to cover holes and pockets are not easily swung so as not to mar the outward appearance of the body, while secure means of locking is almost past one's ingenuity. Bodies as usually constructed would scarcely lend themselves to the project in any case, since internal bracings and projections of one sort or another would most likely be in the way.

WHY THAT NEW TIRE BLEW OUT.

It frequently happens that an automobilist discovers a small hole on the outside of one of his tires and a very serious tear of the inner fabric, altogether out of proportion with the exterior defect. The defective shoe is shipped back to the factory, followed by a letter not very flattering to the manufacturer. Michelin, the tire manufacturer, says they receive many such, the motorist always declaring that it is the maker's fault, for the tire shows its deterioration in the fabric, while the rubber is hardly worn. The reply that they give is that the tire has certainly burst, but that the burst is the result of a cut from the outside. A little experiment will show this. Take a piece of unhemmed calico or linen and try to tear it. The commencement of the tear is difficult, but once begun it can be continued with little effort. Every draper knows this and cuts the calico with a pair of scissors before attempting to tear it. The fabric employed in an automobile tire has the same source of weakness as an ordinary piece of calico. A cut is made in the rubber, a sharp-edge pebble enters in and exerts its maximum effort on the fabric, not on the rubber. The constant contraction and expansion of the tire as it passes over the road soon causes the fabric to cut, and once cut the split will spread with increased facility until it has reached the extreme limits of the shoe. It is not a case of defective construction, as is so often imagined, but an example of the necessity for carefully examining the surface of the tire at frequent intervals and taking precautions to keep out all foreign matter.

AUTOMOBILE PROSPECTS IN SOUTH AMERICA.

South America as a field for the automobile manufacturer only offers mediocre interest at present, but there are indications of a widening field, according to J. B. Bartholomew, of Pretoria, Ill., manufacturer of the Glide car. Buenos Ayres, Argentina, is the city with the largest number of automobiles in use. They number rather more than 200, mostly of French and English make, with just a sprinkling of American cars among them. The import duty is 50 per cent. and the price of gasoline 60 cents a gallon. The people of the Argentine are energetic and up-to-date and there is every reason to believe that a big automobile trade may be done in their country. Pernambuco is a stranger to the automobile, and with its roughly paved streets offers little encouragement to its introduction. Bahia has two or three automobiles, but is hardly more encouraging than Pernambuco.

Rio de Janeiro has better streets than most South American cities, and possesses fifty or sixty automobiles of French and English make. The country back of Santos has a few automobiles, but none are in use in the city, and with streets in their present condition they are not likely to multiply. Montevideo is a field in which manufacturers' agents might profitably labor. The streets are fairly well paved and the mud roads are not at all in bad condition. Taken all in all, it is evident that the Argentine will for a long while constitute practically the only South American market of importance for the automobile.

LETTERS INTERESTING AND INSTRUCTIVE

The Different Styles of Spring Suspension.

Editor THE AUTOMOBILE:

[676.]—I have never been able to find any extensive comparison of the virtues of the different styles of spring systems used on automobiles, and would appreciate having you direct me to some source of such information, or, failing in that, perhaps you would find it worth while to publish something along this line. A comparison, for instance, between the various systems of using full-elliptics, half-elliptics, side springs, etc., would be very interesting, I am sure, to many others of your readers, besides myself.

Peru, Ind. H. E. AGNEWS.

This subject is one that never has been gone into as exhaustively as might be desired by many who have the interest of the industry at heart, so it is not possible to do more than help you out with a few generalizations. The fact that several radically different constructions—the full-elliptic all-around, the half-elliptic all-around, the half-elliptic at the front and the full-elliptic at the rear, the half-elliptic at the front, and the "platform" spring at the rear, and the inverted half-elliptic crosswise at the front, for example—all are considerably standardized and capable of giving good service is enough to prove that this particular detail of automobile design will have to be submitted to many a refining process before any single standard can be achieved, if one ever is. The most-used system to-day is, of course, that employing four longitudinally-placed half-elliptic springs, one at each of the four corners of the car. A particular merit, not often mentioned, which is possessed by this arrangement is that of supporting the frame at eight different, separated points. These points are, moreover, in the best designs, spaced in two series of four each along the two sides of the car. In this way the tendency of running over uneven roads to produce frame flexions must be materially reduced, while at the same time a lighter construction is permitted, inasmuch as the stresses are reduced in magnitude to a degree proportionate to their multiplication in number. Four half-elliptics have the further merit of being light and inexpensive for a given duty, so their wide popularity is not to be wondered at. In favor of full-elliptics is their extreme elasticity and their freedom from the necessity for shackling—merits well established as worth while by their wide prevalence in the best horse vehicle practise. Other of the constructions enumerated may be said to constitute compromises between the full-elliptic all-around and the half-elliptic all-around. Thus the full-elliptic at the front and the platform arrangement at the rear supports the frame at seven points, as against four and eight, respectively, for its two chief competitors. The transverse inverted elliptic at the front, in combination with full-elliptics at the rear, produces a three-point support of the frame, thus removing all tendency to distortion from road roughness, but the frame must be strengthened to withstand the increased stresses due to carrying the weight on points that are more widely separated. For any further information on this subject, we must refer you to the spring manufacturers or to the makers of cars.

What American Cars Have Variable Inlet Valves?

Editor THE AUTOMOBILE:

[677.]—Will you kindly publish a list of the American cars and foreign cars sold in America that are fitted with a variable lift to the inlet valves? This method of throttling is so obviously superior to the customary method of throttling the inlet pipe or carbureter, that it should be given a wide publicity and demanded by purchasers of high-grade cars. If you would like a short statement of these advantages, the writer will be glad to furnish them.

Los Angeles, Cal. ANGELOS.

We do not know of any American cars now on the market that are fitted with the variable-lift inlet valve method of throttling, and, so far as our knowledge goes, the only foreign car sold in this country built on this plan is the Brasier. We believe some of the Renault cars were so equipped in 1905, but it was subsequently abandoned. If you wish to submit an outline of the advantages of this method, we will be pleased to consider it.

Cambering the Driving Wheels of a Car.

Editor THE AUTOMOBILE:

[678.]—Is there any objection to cambering the rear wheels with double chain drive, the effect of such cambering being to twist the chains slightly? If this is objectionable, is there not some way of so arranging the differential that the countershaft can form an angle between its two parts equal to the amount of the camber? Finally, just what are the advantages of cambering?

Litchfield, Ill. JOSEPH A. KIMBER.

A great many cars are built with double-chain drive and cambered wheels, with the chains therefore slightly twisted as you describe. With sufficiently long and flexible chains, there appears to be no serious objection to such twisting. In fact, any chain drive on an automobile necessarily works with the chains twisted much of the time, whether the wheels are cambered or not, for the effect of all road irregularities that temporarily destroy the parallelism of the rear axle and the countershaft is to twist the chains. And inasmuch as few roads are so smooth as not to produce constant sidewise tilting of the rear axle, it follows that chains are proved to operate, and operate well, despite slight twisting. By placing a special differential on the propeller shaft a number of shaft-driven cars are made with cambered wheels. The same plan can be applied to a countershaft. Cambering is very necessary for front wheels, to facilitate steering by placing the point of support on the ground under where a prolongation of the steering-pivot axis would strike. For rear wheels it probably is less necessary than has been believed in the past, when wheels were more markedly dished than is common practice nowadays. Camber originated with horse-vehicle wheels, as a means of keeping the load-supporting spokes vertical despite the dish, which served to oppose the rigidity of a flattened cone—as compared with that of a plain disk—against skidding or slewing forces.

Some Problems of the Differential.

Editor THE AUTOMOBILE:

[679.]—In reading foreign automobile periodicals, I have recently run across a number of articles on experimental automobiles in which the differential gear is eliminated, its place being taken by clutches, ratchets, or the like. All of the discussion on the subject, though, has been so excessively technical (from my standpoint) that I must frankly confess an inability to grasp its points. Will you please tell me what objections there are to the differential? I had always supposed that the purpose of this was to permit one rear wheel to run faster than the other in going around curves, the outer wheel naturally having to traverse a curve of greater length than that taken by the inner wheel. This being the case, why is not a regular differential gear perfectly satisfactory, it being an evident fact that it permits one wheel to make the required gain over the other, while at the same time maintaining the application of power to both wheels?

Dubuque, Ia. C. N. HENDERSON.

The fundamental fault with the balance gear, which is the type of differential used on practically all modern cars, is that it differentiates for *resistances* instead of for *distances*, whereas an ideal mechanism for its place would differentiate solely for distance. The effort to drive both wheels, however, while at the same time permitting one to rotate faster than the other, inevitably involves the trouble referred to. Consequently, only when the difference in resistance is proportional to the difference in distance can the differentiating be correct. Fortunately, this is the usual case when both driving wheels are on road surface of uniform character, but if one strikes a slippery spot, while the other is on a dry one, the latter may constitute a non-rotating pivotal point from which a doubly-rapid forward rotation of the other may be executed. Or, in a less extreme case, the wheel on the drier surface may continue to rotate, but at a rate much slower than that of the wheel on the slippery surface. In either case, a serious skid may be produced. Moreover, in turning a curve, the action is not to apply the power equally through both wheels under any circumstances. Either one or both of

the wheels must slip on the road surface in a degree sufficient to equalize their speeds, or more power must be applied through the outer wheel, because its rate of rotation becomes greater while the tractive stress imparted through it remains the same. A growing realization of these deficiencies of the balance gear seems to be bringing a number of leading European engineers to the belief that it can be discarded with advantage in favor of ratchet and clutch devices. With a ratchet, for instance, the equalizing for varying distance always is perfect, but the drive is definitely applied through the inner wheel on curves. And that this may not be as bad as it appears is suggested in the fact that ordinary running is straight ahead, while curves, when encountered, are in one direction as often as they are in the other. In making one complete turn, no matter of what size, the circumference of the circle traversed by the outer wheel always is greater than the circle traversed by the inner wheel by an amount equal to double the tread, multiplied by 3.1416. This, in the case of a 56-inch tread, is about thirty feet further for the outer wheel to travel. In the case of a car without differential or any equivalent, this means (if the slip be divided equally) that each rear wheel (if thirty-six inches in diameter) must slip one and one-half revolutions in making a complete circle, three-eighths of a revolution in making the more usual quarter turn, and so on. A further advantage of the ratchet is that it permits use of an undivided rear axle or countershaft. The elimination of all differentiating means gives, of course, a still more substantial rotating construction, which is in a degree retained if a clutch in each hub is used, sufficiently tight to drive ordinarily, yet sufficiently loose to slip before the resistance rises high enough to abrade the tire seriously.

Air Cooling by Flanges and by Jackets.

Editor THE AUTOMOBILE:

[680.]—Which is generally regarded as the most successful system of air cooling—that using flanges on the cylinder to radiate the heat, or the one in which air is blown through a jacket surrounding the cylinder? With a flanged cylinder, is it not best to make the flanges of copper or some other metal of high heat conductivity, and to finish the surfaces a dead black, to promote radiation? If not, why not? KARL HANFORD.

Pasadena, Cal.

It scarcely is possible to decide arbitrarily between the two systems of cooling you mention, since both have proved very successful in practical use, and each has a large following of enthusiastic advocates. It is quite possible, too, you know, that there may be more than one way of doing a thing as it should be done. Air cooling by means of flanges proves very effective on numbers of excellent American cars, while the other system, involving the air jacket, demonstrated its merit so far back as on Daimler's first liquid-fuel engine. The best results obtained with both systems have been gained apparently not alone by careful consideration of external conditions, but by also having regard to what goes on within the cylinders. Low compression, for instance, seems to help air cooling, as also does the provision of an auxiliary exhaust port or valve, to drop the terminal pressure of the burned charges very low before permitting any part of them to escape through the regular exhaust valve. Your mention of radiation as a factor in the cooling suggests somewhat of a misapprehension of conditions. While it is true that a heated surface radiates heat in proportion to the character of its finish—dull black surfaces radiating the best—it must not be forgotten that by far the most of the heat removed from a gasoline engine cylinder during the process of cooling is not radiated, but is carried away by convection—by actual contact of particles of air with the heated surfaces. Flanges thus aid cooling simply by affording a greater area of surface for the air to work, but since a given volume of air has a given heat capacity, if this volume can be crowded through the comparatively narrow space of an air jacket, it will pick up a given number of heat units, even though from a less surface. The objection to attached flanges is the impossibility of making a joint between two dissimilar metals so perfect that it possesses a heat conductivity equal to that of a similar area of the unbroken metal. Because of this consideration, the property of the metal to conduct more heat to a greater area is in a degree offset by the inability to transfer the heat with corresponding rapidity from the cylinder metal to the flange metal.

SUGGESTED IN EXPLANATION OF No. 644.

Editor THE AUTOMOBILE:

[681.]—In regard to letter No. 644. It looks as though this man has a lot of trouble with his carbureter. I think he is looking in the wrong place for his trouble. He has a leaky intake pipe. Some of the gaskets or joints must leak, for when he closes his throttle, he says that the engine misses, which shows that the air is going into the engine some other way than through the carbureter. I think if he will look over his intake pipe he will find the trouble. D. F. MAC ARTHUR.

East Boston, Mass.

Editor THE AUTOMOBILE:

[682.]—In regard to letter No. 644, describing "A Puzzling Carbureter Ailment," I have a suggestion to make which might possibly be of service. My car once developed similar symptoms; it skipped when the throttle was closed, but ran evenly as soon as the speed of the motor was increased. In my case, however, the skipping was confined to one particular cylinder. I found the trouble to be caused by a leaky gasket when the inlet pipe joined the defective cylinder. At slow speeds enough air was drawn in at this point to seriously weaken the mixture in that cylinder. At higher speeds this small quantity of extra air was not enough to materially affect the mixture. Now, in the case described in letter No. 644 the skipping occurred in all four cylinders at different times. It might be, then, bearing in mind my experience, that there was a leak somewhere in the main inlet pipe, that is, before it separates to go to the different cylinders. If such a condition existed, partially closing the air inlet to the carbureter at slow speeds would give the proper supply of air, as the writer of the letter discovered. Thus the trouble seems to me more likely to be outside of the carbureter, especially since these carbureters (Schebler) are not prone to this particular trouble, I believe.

Cambridge, Mass. SUGGESTION.

Editor THE AUTOMOBILE:

[683.]—I have had the same trouble that Dick Wiles complains of in No. 644, your issue of March 21. I find that giving the engine a good injection of kerosene oil will help. I take out all of the spark plugs and turn over until one of the exhaust valves is at its highest lift, fill my oil gun with kerosene and shoot half of it at the valve stem, the balance on top of the piston, continuing until all the cylinders have been treated. Then turn over the engine for some time to work the oil well into all the crevices. Then start the engine and while running slowly give the inlet valve stems a dose of the same.

Will advise him to make an extension to the throttle lever to the center of the air inlet, making a hole in the extension at the edge of the air inlet. Make a circular plate the size of the opening of the air inlet with a threaded peg at one edge which pass up through the hole in the extension, and lock nut to hold it in position over the air inlet. The plate can be adjusted to entirely close the air inlet when throttle is closed and opening with it will open the inlet as desired.

Decrease the tension of the poppet valve, and increase the gasoline supply to correspond with the increased supply of air.

Lindsborg, Kan. A. E. AGRELIUS.

"NUTMEGGER" ON NEW YORK-BOSTON "RACES."

Editor THE AUTOMOBILE:

[684.]—It is to be hoped that you, as an exponent of safe and sane automobiling, will lend your aid to the crusade which has been started against the shameless lawbreakers who take part in the races, alias endurance runs, between New York and Boston. If these fellows do not possess any sense of moral decency or regard for the rights of others, it is high time they were made to, even though it might be necessary to use a club in the process. The run, as everyone knows, was made simply to gain a little cheap notoriety and a free advertisement for their cars. The advertisement which resulted, however, is not of the kind which they sought, as, in this section, at least, it has resulted in much bad feeling and in turning the buying public away from these particular cars. A manufacturer who turns out a car that can lay claim to real worth does not find it necessary to resort to such tactics in order to sell his product.

Every automobilist knows that in the past it has been necessary to fight the unfair restrictive measures which are yearly proposed in the legislatures of the different States, and now that he

has succeeded in obtaining some rights that even the country constable is bound to respect, he finds them jeopardized by a few narrow-minded speed cranks. The legislature of the State of Connecticut is in session, and the effect of this race on the minds of the legislators will be anxiously watched by those who look upon automobiling as an elevating recreation. The unfortunate part of it is that these racers do not suffer for their misdeeds. They go by with a rush, and are out of harm's way before the authorities awaken to the fact that the law has been flagrantly violated. Then the next fellow, who, wishing to leave business cares behind, to get a breath of fresh air, to enjoy the scenery and to see the country as God made it, with every intention of obeying the spirit as well as the letter of the law, is stopped, haled into court and made to bear the burden of an excessive fine, which, by every reason of justice and equity, should be paid by the intentional transgressor. It is to be fondly hoped that the opinion of those who are the actual buyers of cars will be so potent a factor against those manufacturers who indulge in this practice, as to make it, in the future, impossible.

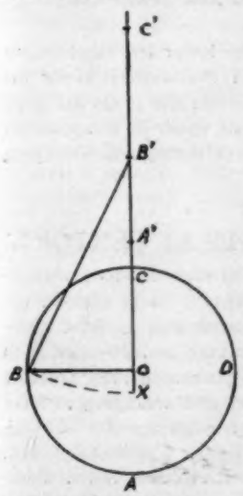
B. E. H.

Norwalk, Conn.

A SIMPLE SOLUTION OF THE PROBLEM.

Editor THE AUTOMOBILE:

[685.]—In a recent issue was given a trigonometrical proof that the descending piston of a vertical engine travels a greater distance during the first quarter revolution of the crank than it travels during the second quarter. This proof was all right, but it seemed to me to either contain typographical errors or else to be so high as to be over the head of an average intellect like mine. I therefore take the liberty to submit a proof simple enough for the average schoolboy.



PISTON TRAVEL DIAGRAM.

Let A, B, C, D be the crank pin circle, with O the center of the circle representing the crankshaft. Let A A', B B' and C C' equal each other and represent the length of the connecting rod in top, middle and bottom positions respectively. It is self-evident that if the rod B B' is allowed to swing or revolve on the wrist pin B' its crank pin end B will describe an arc BX, and that the line B' will be equal to the line B'B. This shows clearly that the piston must be as much below the center of its stroke as X is below O, and that it therefore travels in the first quarter of a revolution a distance equal to C X, and can only travel the remaining distance X A in the second quarter revolution. It is also evident that the rising piston will travel the distance A X in the third quarter and the distance X C in the fourth quarter revolution of the crankshaft.

If the exact distances traveled are desired one needs only to know that the sum of the squares of the two shorter sides of a right angle triangle is equal to the square of the hypothenuse, and (since the lengths of B.O. and B B' are known) subtract the square of B.O. from the square B B' and extract the root of the remainder. This will give the length of B' O, which subtracted from B B' or its equivalent B'X, will give the distance O.X., which added to C O makes the piston travel. Further, the distance O.X. subtracted from O A gives the piston travel of the second or third quarters M, and it is quite plain that C X is greater than X A 20X.

Reading, Pa. C. E. DURYEA.

E. R. THOMAS' CHALLENGE ACCEPTED.

Editor THE AUTOMOBILE:

[686.]—With reference to the challenge issued by Mr. Thomas to Mr. Rolls on account of some remarks of the latter re American cars.

I notice that Mr. Rolls has not been able to accept Mr. Thomas' challenge to pit his British-built car against an American Thomas, but I hope that, as it is a question of superiority, or otherwise, of British products, Mr. Thomas will not be averse to match his car against another British car.

If Mr. Thomas is agreeable (or failing Mr. Thomas any other American manufacturer), I would like to match an Arrol-Johnston car against the American, and suggest that the terms of competition be two or more events, half to be contested in Great Britain, and half in America. The first event to be the International Reliability Trial in Scotland, June 25 to 29, over some of the very worst and hilliest roads in the kingdom, or the International Tourist Trophy Race in the Isle of Man, May 28.

In order to assure the American manufacturer that he will have a worthy competitor, I will remind him that in the six reliability trials since 1900 the Arrol-Johnston cars secured ten awards. In 1905 the Arrol-Johnston won the Tourist Trophy Race (Mr. Rolls' car second), and in 1906, in the same race, the Arrol-Johnston car was credited with fastest time after deducting time occupied for stoppages for fires. The stoppages were entirely a matter of luck, and in no way detract from the performance of the Arrol-Johnston production.

As far as the American events are concerned, any competition giving fair field and no favor will be acceptable to me.

Warrington, England. ERNEST ARNOTT.

MORE LIGHT ON CURRENT CONSUMPTION.

Editor THE AUTOMOBILE:

[687.]—I notice that there is very little said in regard to current consumption, and the matter has about dropped. The letter which Harrold Brown, of Boston, wrote a short time ago was very comprehensive. I think that it demonstrated that with the ordinary form of timers, not accounting for the lags, etc., that takes place, that current consumption is the same at all speeds. Later you made the statement that it was followed up by a correspondent that current consumption depended more upon the surge that takes place upon the breaking of the contact in the timer than upon the actual time the car runs. Now I beg to call your attention to the fact that the surge does not in any way draw upon the source of the current, but is an induced current that takes place in the primary winding, and is in an opposite direction to the flow of the current from the batteries, therefore it does not draw upon the source, but opposes it, and consequently can in no way increase the amount of current consumed.

I might add for the benefit of Mr. Thomas, of Raleigh, and the gentleman who has the six-cylinder Ford, that it is no unusual thing for one cylinder to get more oil than another, and it can be caused from a number of things, such as the bolt that holds the connecting rod bearings together extending down too far, and kicking up more oil than is necessary; also by loose piston rings; by lack of compression; by poor ignition in one or more cylinders; and various other causes. You cannot, therefore, expect to have the cylinders receive the same amount of oil.

Columbia, S. C. CLARENCE T. JONES.

HOW TO PREVENT CARBONIZATION.

Editor THE AUTOMOBILE:

[681.]—Referring to letter No. 640. According to this letter, Subscriber has a lot of trouble with his motor carbonizing. This is the trouble most people are having with their motors. You will find on most motors that the cylinder is counterbored out at the top (combustion chamber) a little more than the finished bore of the cylinder. When the engine is set up you will find that the piston comes up past this counterbore, that is, past the finished part of the cylinder about 1-8 inch, and on some motors about 1-4 inch. Every time the piston comes up it wipes off a little oil, and when the explosion takes place it will spread this around the piston head and cylinder top. This oil absorbs the soot or carbon of the dead gases and deposits it on the piston and cylinder. You will also find, that when the motor misses fire much, it will carbonize much faster. The only way to overcome this trouble is to raise the cylinders so that piston will not come up past the counterbore. I have done this on several machines with good results. The cylinders can be raised by fitting a piece of brass under them. I would advise Subscriber to look into his cylinders, and I think he will find the trouble to be as I say.

East Boston, Mass. D. F. MacARTHUR.

HOW TO PREVENT SOOTING THE PLUGS.

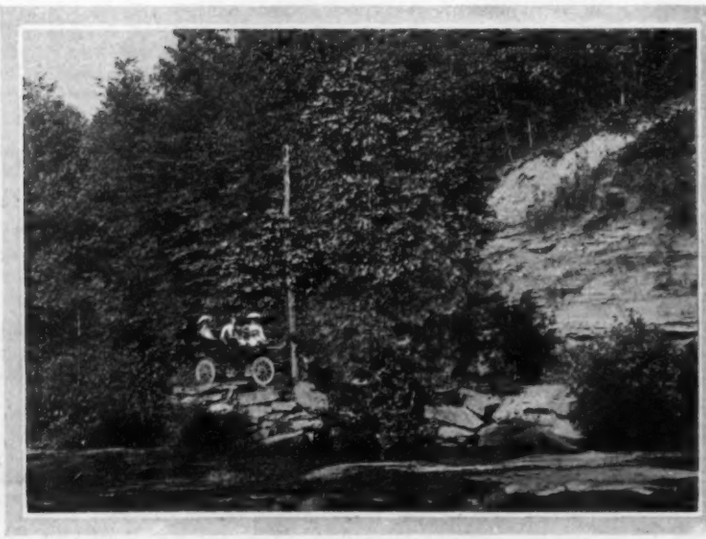
Editor THE AUTOMOBILE:

[680.]—I note in your issue of March 14th, letter No. 631, in which Mr. Royster complains of trouble with his six-cylinder car, in that the spark plugs on the first three cylinders are frequently fouled while the rear cylinders are not. I think the trouble is easily explained by the fact that Mr. Royster is either too exclusive or too particular in his choice of passengers, and does not keep the rear end of his machine sufficiently loaded, that his engine may be level when running, or in other words, the front end of his machine is low, causing the oil in the crankcase to run to the forward end, giving an excess of oil in the front end of his engine.

If this trouble cannot be corrected by carrying more passengers, which, of course is not always practical, or desirable, the front end of the machine will have to be furnished with stronger springs, or blocks inserted between the present springs and the front axle, to raise the front end of the machine the required amount. If Mr. Royster will use "Soot Proof Plugs" he may also overcome a great deal of his trouble.

LEWIS SEARING.

Denver, Col.



PICTURESQUE CENTRAL OHIO SCENERY NEAR NELSONVILLE.

MISS KATE WRIGHT ENJOYING HER QUEEN CAR.

THROUGH THE HOCKING VALLEY.

By N. J. THEISS.

Nelsonville, O., April 1.—Little is known to the autoist of what may be seen on a trip through the Hocking Valley. To strangers the people of this valley have been pictured as supernatural beings, with horns, until travelers have been afraid to venture through this section of the country. This, the center of one of the largest coal fields of the United States, should be a place of much interest to people who have never seen large coal mines. It is a great sight to have opportunity of seeing the "black diamonds" hauled from the hills at the rate of 6,000 tons per day from a single mine. Access may be had to almost any mine, and you will not find a set of people more anxious to accommodate auto tourists than the miners of the Hocking Valley.

At Nelsonville, a city of 7,000 people, and at Athens, of 6,000 population, hotel accommodations are good, the cost for same very moderate. Storage for the machine is not usually more than 25 cents a night. The roads are all limestone pike and generally level. The writer was able to drive from Columbus to Nelsonville, a distance of sixty-four miles, without disengaging the clutch to change from the high gear. An idea of the road condition may be had from the picture in the lower left-hand corner of this page, and also a slight idea of the scenery along the road as you near Nelsonville. In the summer the roads are good from Nelsonville to the Ohio river, thence south in whatever direction desired. Mr. Autoist, take a drive through the Hocking Valley for a change.

MANY NEW PRIVATE GARAGES AT NEWPORT.

Newport, R. I., April 1.—What may be regarded as a reasonably clear indication of the trend of events is to be seen in the fact that many Newport residents are arranging to have automobile garages on their estates next summer and dispense with horses entirely. William B. Leeds, who purchased the Frederick Vanderbilt estate, is selling all his horses and arranging to have the Vanderbilt stables transformed into a garage for six big machines. Perry Belmont, Delancy Kane, Pembroke Clark, Elisha Dyer, Jr., Edward J. Berwind, E. Rollins Mors, Pembroke Jones and a dozen other prominent summer residents are having garages built on their estates. Indications point strongly to the end of the famous Newport driving hour, with the handsome turnouts for which the place has been famous for years.

THE ROAD FROM COLUMBUS TO NELSONVILLE, O.

MR. THIESS AND PARTY FORDING A CREEK ON THE ROUTE

ROLLS-ROYCE SIX-CYLINDER MODELS FOR 1907

THE latest British immigrant, the Rolls-Royce automobile, won popular favor in the old country before invading the new. In the Tourist Trophy race of last year the Hon. C. S. Rolls, driving one of his own machines, defeated the best automobiles of his native land and not a few from France. A few months ago Mr. Rolls came over to this country and left behind him in the hands of Walter C. Martin, of Broadway and Sixty-second street, the American agency under the title of Rolls-Royce Import Company. Only two models are now constructed, both of six-cylinder type, the four-cylinder type which was so successful last year being discontinued.

Standard specifications are 30-40-horsepower model, three pairs of cylinders 4x5 inches bore and stroke, automatic carbureter, centrifugal governor, synchronized ignition by high tension jump spark, two independent sets of accumulators being used. Lubrication is of force feed type. Cylinders are water cooled, tubular radiator, gear driven pump and belt driven fan being employed. Large leather faced cone clutch self-contained to assure concentricity. Sliding gears of selective type are employed, with direct drive on third speed. Propeller shaft drive to rear live axle. Brakes are of internal type on drums of rear wheels and external on large pulley on main shaft. The 40-50-horsepower model has six cylinders cast in two pairs of three. A high tension Simms-Bosch magneto is fitted, there being two independent ignition systems, with both sets of sparking plugs carried in the cylinder heads. Other main features are the same as on the smaller body.

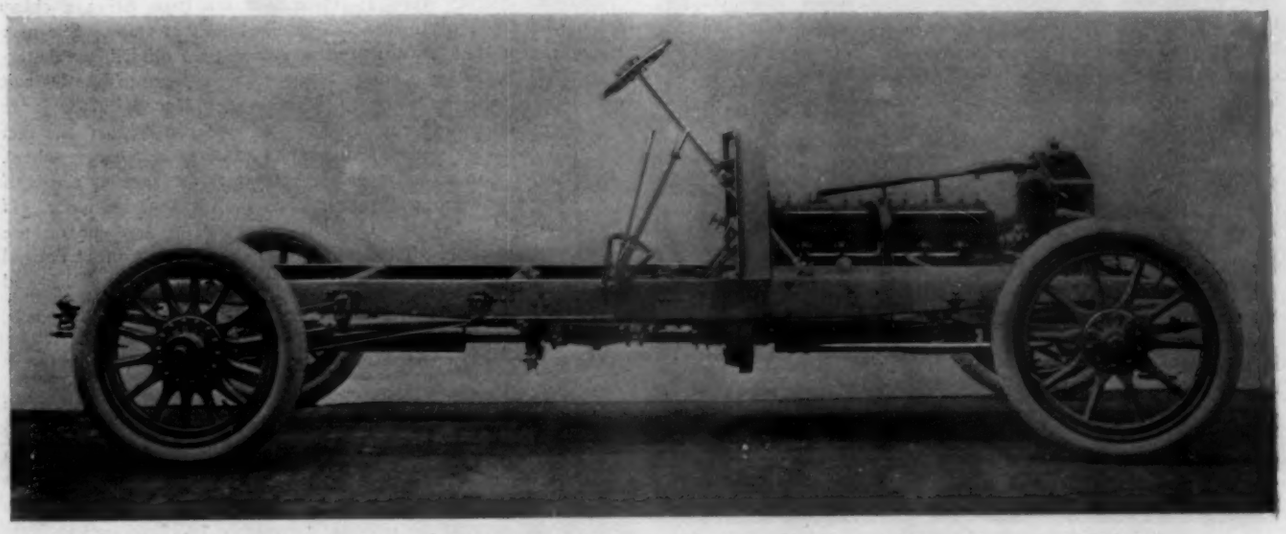
Examining more closely the newer model, the 40-50-horsepower machine, we find that frame is of pressed steel, narrowed in front to give a wider steering angle, wheel base 135 inches and track 56 inches. The frame is carried on longitudinal semi-elliptic springs with a transverse spring in rear. The two groups of three cylinders, 4 1-2 by 4 1-2 bore and stroke developing 48-horsepower at 1200 revolutions, are mounted on an aluminum crank case suspended from the frame by brackets at the rear and a special arrangement of levers at the forward end. The lower half of the crank case is easily dismountable for inspection. Each cylinder is completely surrounded by a water jacket, there being no two adjacent cylinders without water between them. The crankshaft is a solid nickel steel forging, with big bearings at each end and in the center, provided with an anti-friction lining carried in a phosphor-bronze bush. The valve chambers are placed on the left hand side of the engine, one camshaft serving to operate all valves. The shaft and its cams are machined out of the solid. Inlet and exhaust valves are of nickel steel and are interchangeable. The induction and exhaust valves are operated by means of rocking levers pivoted at one end and fitted at the other with a friction roller lying between the valve spindle and the cam. These levers are mounted in pairs, one inlet and one exhaust mounted on one base and attached to the crank chamber by studs. This friction roller lever is claimed to do away with the side pressure which is exerted on the lifter slides when cam and tappet rod come into actual contact. A rather unique arrangement is adopted in connection with the exhaust pipes, there being a small expansion chamber to each set of cylinders leading away to the main expansion chamber below the frame.

The Carbureter is carried in an accessible position on the right hand side of the engine, with induction pipes leading away between the two sets of cylinders joining up to the distributer pipe at the center. The apparatus is a special Rolls-Royce design consisting of three parts very easily dismountable, provided with an adjustable needle valve with a special locking fork. It is warmed by both hot air from the cylinder walls and hot water from the circulating water system.

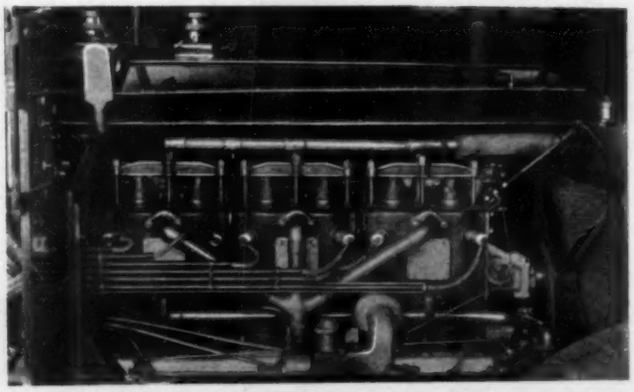
Ignition.—A gear driven Simms-Bosch magneto is employed on the 40-50-horsepower model, but the engine has in addition accumulators and coil with independent plugs in the cylinder heads. Operated by independent gearing on the right hand side of the engine are the ignition distributer and water circulating pump. The coil for the ignition system and the two switches for the double system of ignition are the only parts of the apparatus carried on the dashboard.

Lubrication System.—Lubrication is assured by a positive feed oil pump skew driven off the camshaft and delivering oil under pressure to the main bearings, and thence through the hollow crankshaft to the crank pins and gudgeon pins. By means of an easily adjustable valve under the pump cover a constant pressure of oil is maintained in the oil leads independently of the oil in the reservoir under the crank chamber to which the oil runs through a filter after dropping from the bearings.

Clutch and Gears.—A leather-faced cone clutch is employed of very large diameter and wide face, and self contained to insure concentricity. The gear box is mounted on a sub frame. Direct drive is on the third speed, a gear drive being the high



ROLLS-ROYCE SIX-CYLINDER, 40-50 HORSEPOWER CHASSIS, WHICH HAS JUST MADE ITS DEBUT IN AMERICA.



INTAKE SIDE SIX-CYLINDER, 30-40 H.P. ROLLS-ROYCE.

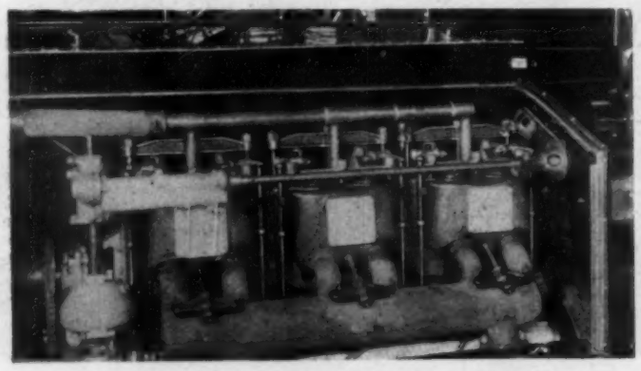
speed. The change speed gear is of the selective type, giving four speeds forward and reverse.

Drive is through propeller shaft and bevel gear to rear live axle. The differential casing is a neat piece of work, comparing very favorably in size with any of the best machines of this type. Hess-Bright roller bearings are used in the rear road wheels.

Brakes.—Internal contracting band brakes operated by the side lever are fitted on drums on the rear wheels. On the driving shaft, immediately behind the gear box, is a 14-inch metal drum fitted with a powerful contracting band brake operated by a pedal. One of the features of this is an arrangement by which the brake can be adjusted by hand entirely without the use of tools. A screwed adjustment rod is provided with a thumb nut, and in order that this nut may not slack back after it has once been set, a spring bolt is fitted to a toggle lever by which the brake is operated.

Control is by spark and throttle lever on the steering wheel. Pedals operate clutch and brake, and there is in addition an accelerator pedal. The steering gear is of reversible type with connecting bar behind front axle on the 40-50 horsepower model.

Thirty-forty Horsepower Model.—As will be seen from the illustrations, the smaller size Rolls-Royce differs in several respects from the 40-50 model. Differences are to be found in the engine only, the transmission, drive and other parts being the same in both models. It will be noted that the inlet valves are in the head, operated by rocker arms, all valves being operated by a single camshaft. The exhaust is led into an expansion chamber running the full length of the engine and led to the large expansion chamber at the rear of the frame. There is naturally a different arrangement of the inlet pipes, the cylinders being in three pairs. The induction pipes lead up from the carbureter on the center of the engine in the form of a three arm, one pipe going to each pair of cylinders. There is only one ignition system on this model; the sparking plugs are placed in the sides of the cylinders.



EXHAUST SIDE SIX-CYLINDER, 30-40 H.P. ROLLS-ROYCE.

HOW ONE PIONEER BUILDER BLAZED THE WAY.

PORTLAND, ME., April 1.—S. A. Nickerson, a pioneer in the automobile industry in America, is a native of Belfast, Me., and a mechanical engineering expert of national reputation. Last fall Mr. Nickerson decided that he wanted to get back to his native State, and, refusing several alluring offers, took the agency here for the George N. Pierce Company, a firm with which he has been for several years. He went into the employ of the company in 1900 and is an expert in the building of steam cars.

Mr. Nickerson drove the first wagon ever propelled by steam. That was in 1869. It was a crude affair built by the House Bros., who were connected with the old Wheeler & Wilson sewing machine business. Mr. Nickerson was called to their factory as an expert to complete this steam carriage. There was a very strong prejudice against its use in the public streets, and to operate it a special permit had to be taken out. The car complete weighed 5,000 pounds. It had wooden wheels with iron tires, and carried three men, a stoker, engineer and helmsman. In 1871 the old contrivance was torn to pieces. Henry House took the wagon apart, turned it into a farm wagon, and used it on his farm in Connecticut. His brother, James A. House, took the boiler, and some time afterwards heated his house and greenhouse with it. Mr. Nickerson took the engine and installed it in his 45-foot open launch.

Mr. Nickerson's next venture in the motor carriage line was in 1886, in another section of the country. He was invited to Massachusetts to assist in building a steam road wagon, which weighed 500 pounds. It would carry one operator, who controlled the entire machine, and one passenger. The power was generated from burning kerosene oil under high pressure by vaporization. The wheels were 48-inch bicycle wheels with seven-eighths inch solid tires. It would make very satisfactory speed on the road, Mr. Nickerson said, but the roads were not at their best then. The public was not then ready to accept a steam road carriage, and the pneumatic tire hadn't come in to make possible a practicable automobile.

In 1895 Mr. Nickerson was again called in as an expert in the building of a steam wagon, and in 1899 went to Chicopee Falls, Mass., to complete for the Overman Co. the first Victor road steam wagon. Then in 1900 he went to Buffalo with the George N. Pierce Co. He built five steam cars in competition with David Ferguson, the present designer of the Pierce Great Arrow, and in a test of one year the gasoline car won out against steam and Mr. Nickerson immediately turned his attention to gasoline carriages and has been following up that line ever since.

DETROIT RATES ITSELF HIGH AUTOICALLY.

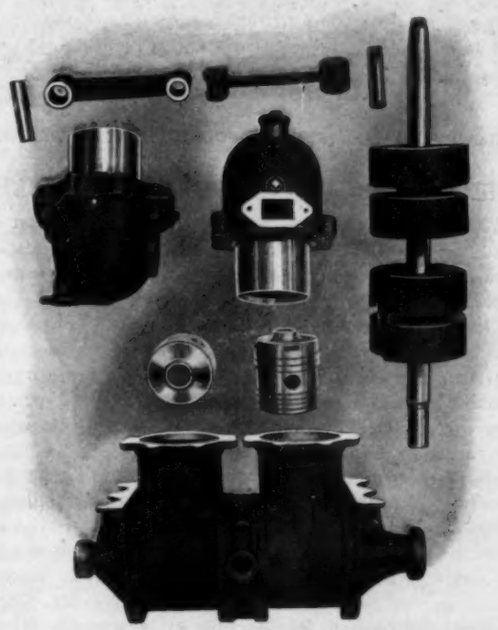
DETROIT, MICH., April 1.—Detroit is far from being a cheap town when anything in the automobile line is at stake. She may not warm up to general sport as do some of the other large American cities, but when it comes to anything in the auto line Detroit enthusiasts are always there. This was evidenced by the large crowds which turned out during show week, in spite of the fact that the ante had been raised from two bits to half a cart wheel. While afternoon attendances were scarcely as large as those of last year, the evening throngs made up for the deficiency. If further proof is needed to show that Detroit is there on the automobile stuff, a little reflection on the vast number that flocked east to the Vanderbilt cup race, and again to the New York and Chicago shows, should convince.

A NATIONAL FEDERATION OF CHAUFFEURS.

LOUISVILLE, KY., April 1.—Through a special delegation from the Chauffeurs' League of Louisville to the Chauffeurs' League of Chicago arrangements were made for the organization of a National Federation of Chauffeurs' Leagues, with Louisville as the headquarters of the movement. The Executive Committee has decided to hold the national convention of chauffeurs in New York City during show week next winter.

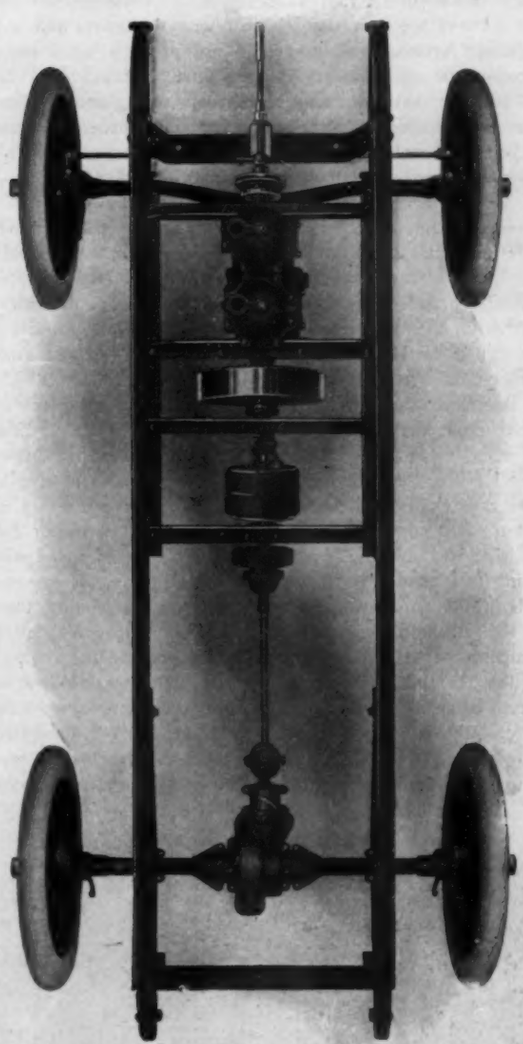
SIMPLICITY OF ATLAS TWO-CYCLE RUNABOUT

APART from the very prominent part that the automobile played during the course of the San Francisco fire and directly after it, the latter disaster was one that in turn was responsible for a development in the automobile industry. For four years preceding the combination of earthquake and conflagration that all but wiped the Pacific Coast city off the map temporarily, the Sunset Automobile Company of San Francisco were building a successful little car with a two-cylinder, two-cycle engine under the same title as that of the company—the Sunset. But the fire wiped out the company's plant and its misfortune led to the acquirement of the right to manufacture the car, besides obtaining the services of its designer, Dorville Libby, Jr., by the Atlas Motor Truck Company, of Springfield, Mass. Prior to this, however, the latter concern had put the Atlas motor to the test during a period of eighteen months and accordingly knew exactly what its capabilities were.

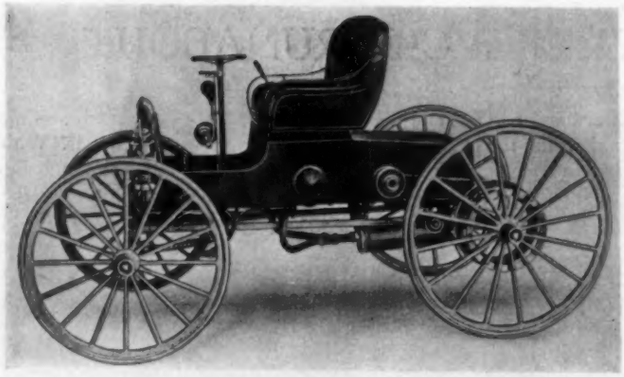


COMPONENT PARTS OF THE ATLAS MOTOR.

The little car was shown publicly in the East for the first time at the show in the Grand Central Palace in December last, where it attracted considerable favorable comment, as did also the huge commercial trucks shown together with it and using the same type of motor. The extreme simplicity of the latter, which means primarily the small number of its components, and particularly small ones that are conspicuous by their absence, may be taken in at a glance upon reference to the accompanying illustration of the complete power plant dismantled, showing its make-up. The latter consists of the one-piece crankcase, the crankshaft, cylinder castings, pistons, piston rings, connecting rods and wristpins, this practically completing the inventory. It may readily be imagined that, starting with a motor as simple as this, the designer would make every effort to carry out the same idea in the remainder of the car, and such has been the case. To realize the extent to which he has succeeded in doing this it is only necessary to glance at the plan view of the chassis as presented in connection with that of the motor. It would be difficult to conceive of anything simpler than this. The motor—disproportionately small by comparison with others of its power—the flywheel, change-speed gear of the planetary type, giving two speeds forward and reverse, and the bevel drive and differential on the rear axle being the only mechanism visible on the entire chassis. With but five moving parts, the motor is extremely quiet and smooth-running. Particular attention has been paid in the design of the motor to making every moving part as free from the necessity of adjustment as is possible, so that the motor seldom has to be dismantled, though this is a very simple operation. The crankshaft journals are case-hardened, ground and polished, bronze bearings being employed—a combination that will run for a long while with no perceptible wear. The construction of the crankcase permits of making it air-tight, without the use of stuffing boxes, which is an important advantage in this type of engine. The motor's speed range is from 100 to 2,000 r. p. m. and the transfer of the charge to the combustion chamber is so perfectly accomplished that a remarkable increase of speed may be obtained merely by advancing the time of ignition. This makes the motor very flexible and gives a wide range of speed to the car without the necessity of dropping to the low, the use of which is mainly confined to getting under way.



ATLAS CHASSIS AS SEEN FROM ABOVE.

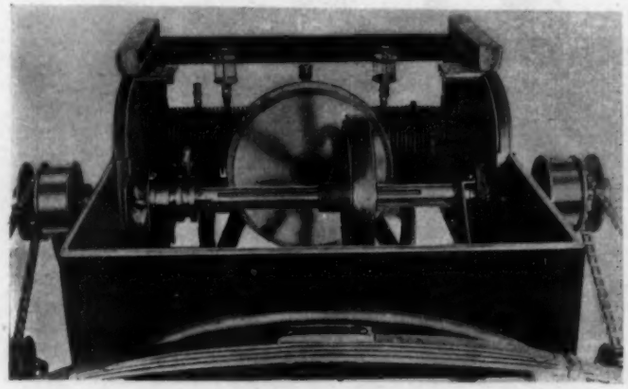


A STURDY REPRESENTATIVE OF THE POPULAR AUTO.

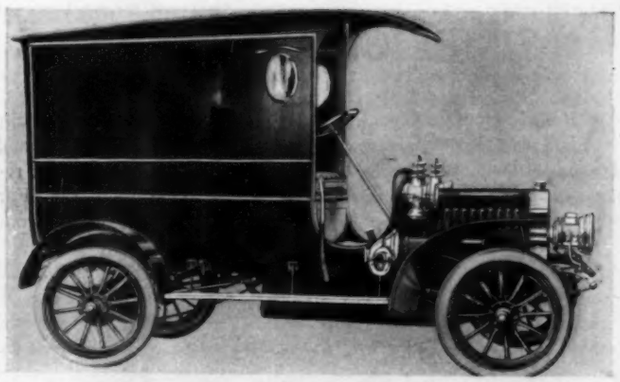
DETAILS OF THE HATFIELD BUGGYABOUT.

On reviewing the specifications of the Hatfield Buggyabout there can be no doubt that its designer has reduced the automobile to its very lowest terms where fewness of parts and liability to accident is concerned. It could not possibly have less, and still constitute an efficient self-propelled vehicle. The details of the entire power plant may be taken in at a glance as pictured in the accompanying illustration. A double-opposed horizontal, four-cycle, air-cooled motor rated at 12 horsepower is placed transversely across the body under the seat, but is so located as to be very accessible in every part. The flywheel is at the rear and its smooth face is designed as one of the members of the friction type of transmission employed. The friction member of the latter is carried on a substantial countershaft supported by liberally proportioned bearings and is arranged to slide back and forth on this shaft on large keyways. In fact, all the parts are designed to withstand the hardest kind of usage and are constructed of materials insuring long service.

No clutch or other disconnecting device is employed, the transmission being further simplified by its elimination. A differentially acting reverse sprocket on which the builders hold patents is placed at each end of the countershaft. This is a simple and positive ratchet device driving in either direction according to the direction of rotation of the friction member. The motor control is sensitive and permits of a considerable range of speed without resorting to a change in the position of the drive. In connection with both the suspension of the body and the chains, there is fitted the Hatfield shock absorber, which performs the offices of dampening the jolts and automatically keeping the chains taut as well as in the correct alignment at all times. Wheel steer, mounted on a vertical steering column, is employed. At its lower end the column carries a pinion engaging a semi-circular rack, to the ends of which the front axle is attached—a type of steering gear made familiar by years of use on fire apparatus.



SIMPLICITY OF THE "WORKS" OF THE HATFIELD.

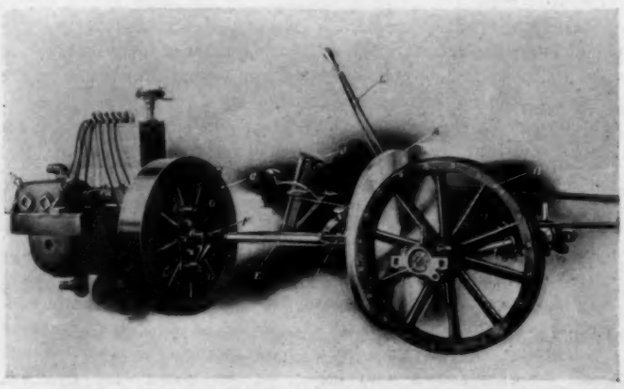


HANDY AND EFFICIENT 1,000-POUND DELIVERY WAGON.

THE CARTERCAR COMMERCIAL VEHICLE.

Upon the same chassis which serves as the foundation of the runabout, folding tonneau and regulation touring types of the Cartercar, the builders of the latter have, for some time past, been specializing a medium capacity delivery vehicle. That the former lends itself admirably to the requirements of such service is evident from the size of the body that may be used as well as the convenient placing of the power-plant, which in no way interferes with the disposition of the load carried and permits of reaching every part of the mechanism without trouble when the body is full.

This wagon has an effective carrying capacity of 1,000 pounds, and is equipped with the 20-24-horsepower, two-cylinder, horizontal-opposed motor placed transversely on the forward end of the frame under the bonnet, the same as the regulation pleasure cars of this make. All the small parts of the motor mechanism are placed on top of the latter, making them easily accessible. The well-known type of friction disk drive specialized on cars of this make is employed, the shaft carrying the friction disk being attached directly to the motor flywheel, thus eliminating the usual clutch, while the drive itself does away with a change-speed gear box and its troubles. As will be evident from the illustration at the foot of the column which pictures the power plant and transmission complete, the countershaft carries a spoke wheel the periphery of which is shod with the friction surface to engage the large revolving disk against which it is pressed. The relative positions of the two by means of which a wide range of speed is obtained in either direction, are changed with the hand lever shown. This single lever gives all the gradations from zero to the highest speed as well as the reverse, which is also utilized when occasion requires as a brake, in which rôle it is said to be extremely effective and sensitive. On the whole, the car is very simple and efficient, which means reliability and freedom from accident in inexperienced hands.



COMPLETE POWER PLANT AND TRANSMISSION OF CARTERCAR.

FOR AND ABOUT THE GRAND PRIX

PARIS, March 26.—There is bustling activity both at the Automobile Club of France and in the reserved quarters of the different factories where racers are being built for the Grand Prix. The Sporting Commission, which is supreme authority in all that concerns the French club's speed contests, has definitely decided not to construct a banked turn at the Dieppe corner of the circuit. At this point the road is V-shaped, the angle of the V pointing towards Dieppe. A building stands on the edge of the turn, on the inner side of the circuit, and to avoid this difficult corner altogether it was proposed to make a special wood track, joining up the two arms about fifty yards from the fork. The cost would have been about $3,000. After much consideration, the Sporting Commission has decided that it would not be advisable to turn the circuit into an artificial racing track. Banked up, the turn could have been negotiated at sixty miles an hour; in its natural condition it will have to be tackled at a very slow speed.

The main grand stand and the press stand will be built between the main road and the side track on which will be established the tire and gasoline stations, and from which the Sporting Commission Cup racers will be started. They will thus be on a kind of island, for the loop track will be as rigorously closed to the public as the main course. A tunnel will give communication with the outside of the circuit. Opposite the stands will be very large scoring boards, placed obliquely so as to be visible from all the stands. A new feature will be the placing of Venetian masts at regular intervals along the road in view of the grandstand, to allow the public to calculate the speed of the competitors as they rush by on the fastest stretch.

Darracq Engages Caillois as Race Driver.

Gustave Caillois, who is well known in America on account of his connection with the Thomas firm in the last Vanderbilt Cup race, has signed an engagement with the Darracq Company to drive in all the principal events of the year, and will doubtless represent that firm, together with Wagner and Hanriot, in the Grand Prix. Caillois has long been recognized as one of the most skillful drivers that France possesses, but it is in connection with the famous Brasier team of the last two Gordon Bennet races that he is best known to the public. Only a few weeks ago he severed his connection with the Thomas company.

Training on the circuit is a daily affair, Albert Clement and Garcedt on Bayard-Clement racers being particularly active. Stricker, who will have charge of the Porthos racer, has set out for a run to Rome and back as a preliminary training. Two of the three Renault racers intended for the Grand Prix are now ready and will make their first run on the Dieppe circuit before the end of the week. As last year, Szisz will be the head of the racing team. The machines will be given a preliminary tryout of about three days.

Two of the three motors which will drive the Panhard-Levassor racers will be tried out on the *Panhard-Tellier* and the *Rapière*, two of the motor boats taking part in the Monaco meeting to open on April 1. As soon as the motor boat races are over, the engines will be put on the chassis now being built and prepared for the 30-liter road race.

Lorraine-Dietrich is building three distinct classes of racers this season. Two are for the Targa Florio, two for the German Emperor's Cup race and three for the Grand Prix. The lack of uniformity in European races makes this multiplicity necessary.

ARDENNES RACE UNDER NEW CONDITIONS.

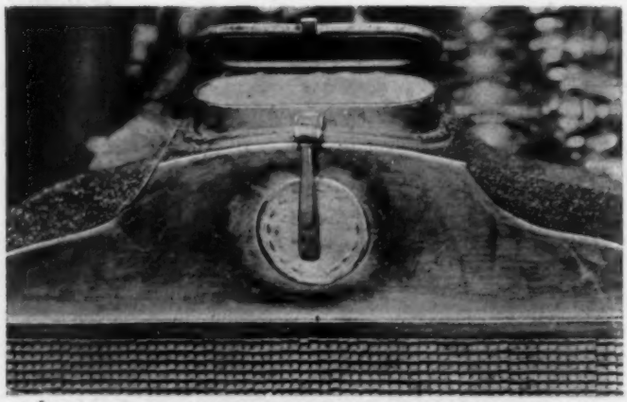
BRUSSELS, March 27.—The Automobile Club of Belgium has abolished the old weight limit for the Ardennes race to be run on July 22 on a 53.2 miles circuit, starting from Bastogne, to be covered seven times, giving a total of about 372 miles. New conditions are: Cylinder capacity, 8 liters; minimum weight, 2,585 pounds, including racing body and tires, but without tools and spare parts. Gasoline of 690 degrees will be furnished by the racing board. Dismountable rims can be used. There will be no controls; each firm may establish its own tire and spare parts stations. Three machines may be entered from any factory at a cost of $500 each up to May 15 and $800 until July 1. Starts will be given at intervals of one minute from 6 A. M. No European race is now run under the old 1,000 kilos weight limit.

THE 1907 SALON DE L'AUTOMOBILE

THE first auto show ever held in France, or, more correctly, the first exhibition at which automobiles were exposed, was opened by the President of the Republic at the Palais de l'Industrie, Paris, in December, 1895. The first automobile Salon to be organized by the Automobile Club of France was housed under tents in the Tuileries Garden, in June, 1898. The one to be held this year is thus the tenth in an uninterrupted line of succession. Each year the Paris Salon has become more and more brilliant, and during the last two years has been, without a doubt, the largest, most artistic and most luxuriously decorated of any trade show in the world. The next show, to be held during November and December, will be a decennial worthy of the national industry. Although yet far in the future, Gustave Rives is at work on the great event and has already published the detail regulations. The show will last twenty days instead of fifteen as in recent years.

The 1907 Salon will be held as usual in the Grand Palais, with a temporary building, probably on the Esplanade des Invalides, for the commercial vehicles, machine tools and motor boats. The Avenue des Champs-Elysées, the Place de la Concorde, including the Automobile Club of France, the Alexandre III bridge, the Esplanade des Invalides and the Place de l'Etoile will all be brilliantly illuminated. These avenues and squares comprise the finest that Paris possesses and will be illuminated in a manner that has not been equaled since the visit of the Russian Emperor to Paris on the occasion of the inauguration of the Alexandre III bridge across the Seine. The exhibition, in fact, will be a huge national automobile demonstration.

Request for exhibiton space in the Paris Salon must be made not later than August 15. Positions will be granted by the drawing of lots on September 1. Requests for show space received after August 15 will only be considered if any space is available after satisfying early entrants. Following a now established custom, a central portion of the hall will be reserved to a limited number of the oldest and most important French houses. The central stands will have a maximum area of 80 meters, at a rental of $2,000. Other stands on the ground floor vary in price from $20 to $5 per meter, according to position. Space in the galleries will cost four or five dollars a meter, according to position. These prices are for bare floor space, and include neither flooring nor carpets. Each stand must be decorated at the cost of the exhibitor to harmonize with the general decorative scheme of the hall and subject to the approval of the committee. Many of the stands will be marvelous examples of illuminated wrought-iron work, costing amounts frequently double the price of the high rental.

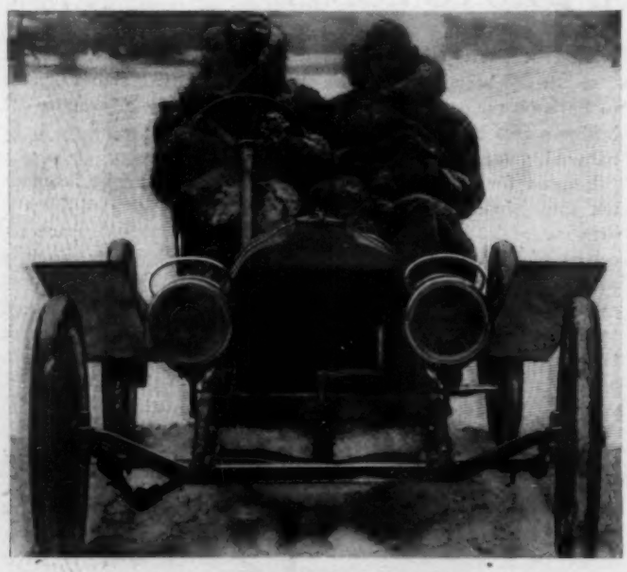


OBLONG FILLER OPENING ON THE B-L-M TANK.

LITTLE THINGS THAT SOMETIMES LOOK BIG.

Little things have the power of making life either a burden or a pleasure, and this is true in automobiling as well as in other pursuits. Many automobile manufacturers show a keen appreciation of the fact in the minor improvements made about their machines. An example is seen in the B-L-M starting crank and the radiator filling cap, both of which are here illustrated.

The crank is so arranged that though it is a fixture in so far as it cannot be taken from the car, it is held flat against the radiator when not in use, instead of projecting threateningly forward like the ordinary fixed crank. The crank turns in a sleeve which is so pivoted that it can swing vertically, carrying the crank with it. The crank has a longitudinal sliding movement in the sleeve, so that when the latter is brought to a horizontal position, in line with the crankshaft of the motor, the crank can be pushed toward and into engagement with the motor shaft. A pin holds it in this position, as if it were a fixed crank, though the usual pin-and-notch arrangement is provided to prevent the crank being carried around by the shaft after the motor has started. When the motor has picked up and the crank is no longer required, it is first slid out of engagement by drawing it away from the crankshaft, when it can be swung up flat against the radiator, the swiveled sleeve holding it and preventing its removal from the car. A pair of brackets with deep notches into which pins on the crank are allowed to drop, holds the crank in the position shown in cut.



B-L-M 24-HORSEPOWER TOURING CAR.
Showing folding crank turned up against the radiator when not in use.

It is no joke to try to pour a bucket of water into a small round hole at the top of a radiator, not only is the process slow and bothersome, but water is often slopped over the ignition apparatus, causing short-circuits. The B-L-M filler is a generous oblong opening that will easily swallow the wide, thin stream of water poured from a bucket without slopping or loss of time. A heavy brass cover, fitted with a gasket to prevent leakage, is held down when closed by a single lever which turns down over the cover, pressing down a cam on a lug on the edge of the cover and firmly closing the opening. It is the work of but an instant to open and close this filler, and there are no threads to stick or refuse to catch and no loose top to get lost—or to drop suddenly when found to be unexpectedly hot.

LOCOMOBILE PROMINENT AS NEWS DELIVERER.

It seems fitting that the Locomobile should be one of the first gasoline cars to be identified with the rôle of newspaper delivery wagons in this city, as it was in a former incarnation—the little "teakettles" of several years ago that the steam cars of the same name first usurped the place of the madly tearing horses and equally wild drivers intent upon delivering extras and early

BROOKLYN "EAGLE'S" NEW LOCOMOBILE DELIVERY CAR.

editions who have so long been a feature of metropolitan life, and one that is dreaded by the pedestrian. The accompanying photograph shows the modern successor of the little steam wagons. It is a 22-horsepower Locomobile chassis of the model of 1907 fitted with a special body by the I. S. Remsen Manufacturing Company, of Brooklyn, and is employed in the service of the Brooklyn *Eagle*. The car is said to do splendid work in its new field, as well it may, and will doubtless prove to be the forerunner of many others for similar work.

USED A CIDER KEG AS A COOLING SYSTEM.

That there are many things which may happen to a car without putting it out of commission if a little ingenuity be exercised, was well proven by a rural autoist in Michigan during one of the cold snaps of the past winter. He was located eight miles from the nearest repair shop and one night the radiator of his car froze solid. He wished to use it the next morning, but did not care to run the risk of increasing the damage, so he rigged up a home-made cooling system. A cider keg full of water was placed on one of the front seats and a piece of garden hose led from it to the cold water intake of the cylinder jackets. The drain cocks of the latter were opened sufficiently to let the water drip out of them fast enough to keep the engine cool, so that the trip was made successfully, and another "useful hint" added to the breviary of the automobilist.

PROSPECTS FOR TRADE IN RUSSIA.

Commercial vehicles are likely to meet with much success and motor boats might be extensively empolyed on Russia's vast river system. All the difficulties incidental to the establishment of a new industry will be felt by pioneer automobilists in Russia; in addition, the customs authorities do not facilitate matters, and free circulation either within the country or about the frontiers is not always possible.

Notwithstanding, European manufacturers are resolved to do business in Russia. French firms already having agencies in that country are Darracq, Renault Freres, Bayard-Clément, and Chenard & Walcker. Oldsmobile is, we believe, the only American firm which has attempted to trade with Russia. In view of the low temperature prevailing for the greater part of the year, air-cooled cars are likely to meet with special favor, and it is here that American manufacturers might steal a march on European builders. In addition to the firms already having agencies, the following important houses have decided to exhibit at the St. Petersburg show: French, Lorraine-Dietrich, C. G. V., Mendelssohn, Panhard-Levassor, Delaunay-Belleville, Berliet, Mors, Sizaire & Naudin, Cotton-Desgouttes, Labourdette; Belgian, Minerva and Franeau; Italian, Fiat, Bianchi, Standard and Turckheimer; German, Mercedes and Adler.

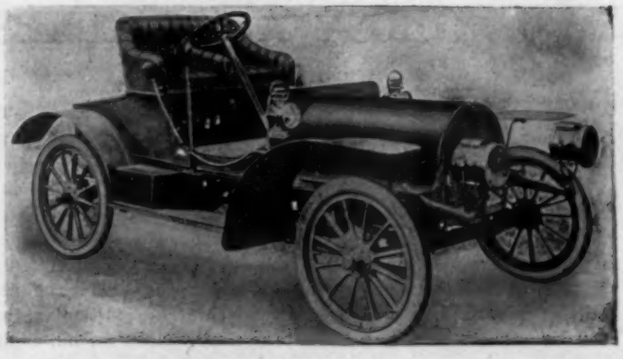
MORS 17-HORSEPOWER CARRIAGE FOR TOWN USE.

AN AUTO FOR TOWN SERVICE.

King Edward of England has added to his automobile "stable" one of the new 17-horsepower Mors town carriages, with motor under the seat. Automobiles specially designed for town service were a special feature of the last Paris salon, and among the many excellent chassis exposed the Mors occupied a high position. King Edward was so pleased with this little machine that he purchased it on the spot, declaring that the fittings and upholstery were all that he could desire. One of the distinctive features of this machine is the ease with which it can be turned in the narrowest of streets and in the most crowded thoroughfares. Cryder & Company, American agents for the Mors, Broadway and 63d street, New York City, state that society leaders here are placing numerous orders for this type of the Mors for town use.

A MICHIGAN AUTO CITY THAT THRIVES.

PONTIAC, MICH., April 1.—In three short years our automobile industry of Pontiac has sprung from nothing to a point where 400 men are now employed, and with the completion of additions to the two auto plants here the number of workmen will be increased at least fifty per cent. The two plants here are those of the Rapid Motor Vehicle Company and the Welch Motor Car Company. The Rapid Motor Vehicle Company, which a year ago moved into its new building, now has plans for an addition, 60x150 feet in size and two stories high.



SERVITOR RUNABOUT, 20-H.P. AND AIR COOLED

ATTRACTIVE NEWCOMER FROM SANDUSKY, O.

Under the title of the "Servitor," the Barnes Manufacturing Company, 1400 Columbus avenue, Sandusky, O., are placing on the market an attractive runabout of the speedy type which combines a number of novel and commendable features. Taking as its motto "A car for service," its designers have striven to eliminate every feature that could possibly tend to reduce the factor of reliability in service and have succeeded in producing a car which should ably substantiate its apt title. For instance, its 20-horsepower engine is air-cooled, thus relieving it of considerable of the usual burden, while the gearless transmission is employed, thus making the car extremely simple to operate and with no risk of damaging it on the part of an inexperienced driver. The foundation of the chassis consists of a pressed steel frame of standard channel section, mounted on well-proportioned semi-elliptical springs front and rear. Drive is by means of propeller shaft and bevel gearing to the live rear axle. A round bonnet shelters the motor and its lines blend well with those of the two-seated body finished in red upholstery, the shape of the mud guards also being made to harmonize.

PETROLEUM ENGINES FOR THE FRENCH NAVY.

For some time a Commission appointed by the French Government have been inquiring into the question of the possible use of petroleum engines in the French Navy, says *Engineering*. After completion of their tests, the Commission have recommended the adoption of the Cazès and the Mietz and Weiss systems and the sets of engines on which the tests were made have been purchased by the Government.

FRANKLIN TYPE J TRUCK AND ITS BIG LOAD.

This is the car on which the H. H. Franklin Mfg. Co. has been giving the worm-gear drive a most severe test. The tire chains prove very efficacious on the slippery street.

BUSY AUTO CLUBS AND THEIR DOINGS

Quaker City Motor Club Climb Will Be Held on May 30.

PHILADELPHIA, April 1.—The active season of the Quaker City Motor Club will be inaugurated a fortnight earlier than intended in response to the demands of charity. The Ladies' Aid Committee of the Pennsylvania Epileptic Hospital and Colony Farm asked the club to assist at a motor carnival at the Belmont track on Saturday, May 18, and the board of governors decided to accept. The contest committee is already at work on the details of a program including many novelties in addition to the regular speed events. The exact course over which the hill climb will be run has not yet been decided upon, but the contest committee has decided to adhere to its original intention of running off the event on Memorial Day. This action definitely bars City Line Hill from the list of probabilities, the combined opposition of the G. A. R. Veterans, the cemeteries and the horsemen having been too bitter to overcome.

COVER OF MENU CARD USED AT BANQUET OF THE ROCHESTER AUTOMOBILE CLUB, MARCH 25.

How Drought, of Milwaukee Club, Increased Speed Limit.

MADISON, WIS., April 1.—Giving legislators free rides in automobiles has resulted in the killing of a bill in the Legislature regulating the speed in cities to six miles an hour and in the country to eight miles.

James Drought was sent to Madison by the Milwaukee Automobile Club to induce the legislators to take rides and then demonstrate different speeds. They were taken for rides about the city and out in the country. As a result all stringent laws regulating the speed in the country to less than ten miles will be killed. Assemblymen believe fifteen miles would be about right.

Washington Club on Maryland Law Violations.

WASHINGTON, D. C., April 1.—A special meeting of the Automobile Club of Washington was held March 28 for the purpose of taking some action with reference to the constant violation of the speed laws of Glen Echo, Md., located on the Conduit road.

The meeting was largely attended, and while the sentiment was unanimously in favor of upholding the Glen Echo authorities in curbing the speed mania now so much in evidence on the Conduit road, it was equally unanimous against Charles Collins, Glen Echo's Town Marshal, who makes life a burden for the automobilists, whether they violate the law or not.

Chairman Miles Makes Earnest Appeal for the Orphans.

NEW YORK, April 1.—June 12, the National Orphans' Day instituted by the A. A. A., has been fixed by the New York Motor Club as the day when the children of the orphan asylums of the city will be given their annual outing. For the past two years the club has successfully carried out this excellent work and has brought an immeasurable amount of happiness to the little ones. The third event, it is hoped, will be larger and more successful than any of its predecessors. No expense or trouble will be spared by the club to make it so, and if owners of automobiles accord the support which the object deserves it will certainly be a huge success. S. A. Miles, chairman of the Orphans' Day committee, has received offers of a number of cars, but still more are required. Two hundred and fifty automobiles could easily be filled, and Mr. Miles has made an earnest appeal to owners to lend their machines and drivers on June 12. The claims of the orphans only need to be mentioned for true-hearted men to respond willingly and generously.

South Bend Enthuses Over Indiana State Body.

SOUTH BEND, IND., April 2.—The South Bend Automobile Club will take an active part in the formation of the Indiana State Association through its president, John J. McErlain. Since the A. A. A. renewed talking of organizing State bodies throughout the country and Secretary Elliott of the national organization wrote E. C. Briggs of South Bend, telling him of the intention to form a State association in Indiana, there has been an increase in local interest in autoing, and the South Bend club has taken the initiative in bringing about a State association.

The local club will hold a big meeting about April 15, and will at that time outline plans for an extensive campaign. Owing to the many new automobile owners there will be an enlarged membership this season. The matter of local interest in the A. A. A. tour has been turned over by the club to the Tincher Motor Car Company of this city. A canvass of the members of the local organization will be made to get their wishes in the matter, after which a report will be made to the A. A. A.

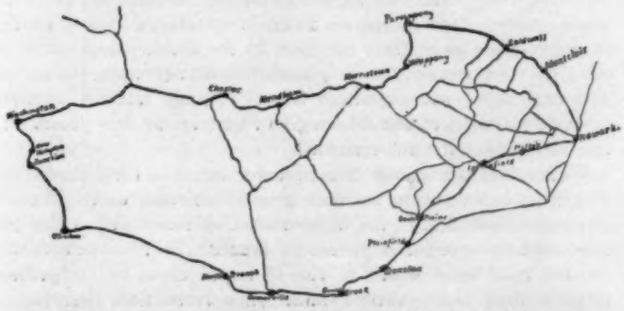
Rules Adopted for the New Jersey Endurance Run.

NEWARK, N. J., April 1.—Practically all arrangements for the three-day endurance run of the New Jersey Automobile and Motor Club have been completed. The contest will be held May 30 to June 1, is primarily for the purpose of demonstrating the powers of endurance of automobiles, and is open only to members of the New Jersey Automobile and Motor Club. As will be seen by the accompanying maps, the route will be entirely over New Jersey roads and will closely approximate conditions that are met with in touring. Two classes of cars will be scheduled, touring and runabout, and to the winner of the first class will be awarded the Shanley trophy—to the winner of the last mentioned class the Sinclair trophy.

One of the most stringent rules relates to official observers, and states that every vehicle shall carry an official observer, for whom a front seat shall be reserved, and cars shall be under observation continuously, from the time of the start until the close of the contest, either by the observers on the car or the person or persons in charge of the garages. Entrants must nominate one observer in respect to each car entered by them. The name of such observer must be submitted at the time the entry is made. No observer shall act as such upon the car of his nominator, and the committee reserves the right to reject any nominee without giving reasons therefor. Each observer will, so far as practicable, be placed on a different vehicle each day. He must not in any way assist drivers or cars; for instance, he must not turn on

lubricators or perform any functions, however small, in connection with the car. He must not even assist drivers with suggestions as to what to do in case of trouble.

Competing cars must carry a full complement of passengers of an average weight of 125 pounds each, and competitors must



FIRST DAY'S ROUTE OF THE NEW JERSEY ENDURANCE RUN.

conform strictly to traffic regulations and speed laws as provided by the statutes of the State of New Jersey. No stop of a car for repairs or other cause can be made without penalization, save in the event of tire trouble, and competitors on entering assume entire responsibility for their respective cars and the damage which may be done to them during the run.

In the matter of penalization cars must adhere to schedule within five minutes either way to avoid it. The penalizations are points per minute or fractions thereof for the following:

	Points per Minute.
To arrive at any control more than five minutes before or after schedule time	2
To stop car or motor between controls without making repairs or adjustments	3
To stop car or motor to make repairs, adjustments or replacements	2
To make repairs or replacements without stopping motor	1

To have one or more persons render assistance in any way, the time of such person or persons will be charged at double the rate as, and in addition to, that charged against the driver. No penalty will be noted against puncture of tires, but if a puncture occur and the car does not arrive at the control within the prescribed time, points will be scored against the car, as above, for each minute late.

SECOND AND THIRD DAYS' ROUTE.

No record will be kept of the amount of oil or gasoline used, but neither must be put into the tanks unless under the supervision of the observer, and then only while a car is in a control.

Entries must be filed with fees on or before the hour of 6 P.M., Wednesday, May 22, with Secretary H. A. Bonnell, 1034 Broad street, Newark, N. J. W. C. Shanley, donor of the trophy for touring cars, will officiate as referee.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.
April 11-13.....—Denver, Col., Automobile Show, Coliseum Hall, G. A. Wahlgreen, manager.
Oct. 31-Nov. 7..—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
Nov. 30-Dec. 7..—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, National Association of Automobile Manufacturers.

Races, Hill-Climbs, etc.

May 6-7.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
May 30-June 1..—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
June 12.....—National Orphans' Day, instituted by the American Automobile Association.
July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 28.
Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

FOREIGN.

Shows.

April 6-13.....—London, Agricultural Hall Motor Show.
May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
June 25-30.....—St. Petersburg, Russia, Automobile Show.

Races, Hill-Climbs, etc.

April 1-16.....—Spring Wheel Competition, A. C. of France.
April 18.....—Paris, La Coupe des Voiturettes, A. C. of France.
April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
April 25-28.....—Touring Contest, Automobile Club of Touraine.
April 28.....—Chateau Thierry Hill Climb.
May 15-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
May 18-21.....—Milan, Italy, Touring Club Trials.
May 22-25.....—Irish Automobile Club Reliability Trials.
May 24-27.....—Voiturette Contest, Automobile Club of Austria.
May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
July 2.....—Grand Prix, Automobile Club of France.
July 14, 1908....—Paris to London, Aerial Race.
July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
July 21.....—Ardennes Circuit (Belgium).
July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
July 31-Aug. 8..—Belgium Regularity Contest for Touring Cars. A. C. of Belgium.
August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup. A. C. of France.
August 11-29....—France, Coupe de Auvergne.
Sept. 1.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.

THE AUTOMOBILE

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H. M. SWETLAND, President

EDITORIAL DEPARTMENT:
A. G. BATCHELDER, Managing Editor
R. F. KELSEY, Associate Editor C. B. HAYWARD, Engineering Editor
W. F. BRADLEY

BUSINESS DEPARTMENT:
A. B. SWETLAND, Business Manager
L. R. SMITH B. FRANK BARNETT
W. I. RALPH, 1035 Old South Building, Boston, Mass.
C. H. GURNETT, H. H. GILL, 625 Monadnock Block, Chicago, Ill.

Cable Address - - - - - - - - - - - - Autoland, New York
Long Distance Telephone - - - - - - - - - 300 Gramercy, New York

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"	in 1906,	791,000
"	This Issue,	18,000
"	Since January 1,	226,400

Concerning Letters Interesting and Instructive. Some of the letters we have received recently for publication under the caption of "Letters Interesting and Instructive" make this a fitting opportunity to comment on the widespread interest this department of THE AUTOMOBILE has been instrumental in arousing on the part of autoists all over the country. Every enthusiastic owner who has the time and opportunity is desirous of mastering his car, but there are many, many things that are only to be learned by traveling the hard road of experience, and help in solving the problems as they come along is naturally much sought after. But there are so many different makes of cars, each with its own peculiarities, that it would be next to impossible to have a knowledge of all of them, and while we endeavor to aid in the solution of every problem that arises, there are naturally frequent occasions when only the man who has an intimate acquaintance with the particular car in question can come to the rescue. Here then is the subscriber's opportunity to benefit himself, and doubtless others in the same predicament, and it is certainly encouraging to note how frequently this is the case through the medium of our correspondence clearing house. Occasionally a reader will take us to task under the impression that we are attempting to pose as infallible oracles in all things automobile. We are not only willing but anxious to be shown so that we can help the next fellow, so that this calls for no comment on our part. Whenever you are in need of information or help in solving a knotty one, write to the editor, and, if in our power, we will try to make things clear; if not, numbers of our subscribers will come to the rescue.

To Be No Dearth of Interesting Competitions. Judging from present indications, few years have opened with better prospects of the holding of a number of interesting contests than the present. Realizing the shortcomings of the 1906 A. A. A. Tour rules, the conditions have been revised in a manner that should be productive of an event far more interesting and instructive than either of its predecessors. Instead of the wild cross-country dash under conditions that savored more of the transfer of an army from one part of the country to another in time of war, rather than a peaceful cavalcade bent mainly on pleasure, there will doubtless be a "touring" contest as near to the realization of the meaning of that term as it is possible to approach under the circumstances.

Where the racing end is concerned, there is little doubt but that what has come to be more generally known as the American automobile derby—the Vanderbilt Cup race—will, under the new conditions imposed, or rather granted, by the use of a restricted road upon which to run it, be an event of far greater interest than was possible under the restrictions necessarily adhered to as closely as possible in former years. Every assurance is forthcoming that, shortly after this, there will be run off, on the same course, a contest for American supremacy that will be of even more vital interest to the American builder than the international event that precedes it. These three, supplemented by numerous club events of a similar nature, should leave little to be desired in the shape of touring and racing competition during the coming season.

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Duplicating the Ignition System Finds Favor. Time was when not alone the average autoist, but also the supposedly well-informed designer and manufacturer looked askance at any suggestion of the magneto, and that was not long ago either. Considered from one point of view, there has been little if any change in ignition systems generally during the interim, though in another sense there has been somewhat of a revolution. In other words, there has been no radical change in the appliances and apparatus employed to generate or utilize the electric current for ignition, but there has been an almost complete reversal in the status of the different systems. Taking into consideration current practice as represented by American makers alone, there were but few advocates of the low-tension system of ignition in this country a few years ago; there were even fewer who were disposed to look favorably upon the magneto of either type.

To those who are familiar with this essential as represented on the up-to-date American car, it is hardly necessary to comment at length on the change that has come about since then. During the interval both the accumulator and the magneto have been developed to an unthought-of extent, and the fact has been recognized that regardless of the perfection to which a system may be brought, the best factor of safety is duplication. If any one had had the temerity in 1903 or 1904 to venture the assertion that within a year or two, cars employing both the low and high-tension systems of ignition would be built, he would have immediately been classed as a "revolutionary," meaning one of that type of inventors the product of whose genius is bound to sweep away all existing efforts—in his own opinion.

Regarding the matter of providing an adequate factor of safety, the former "reserve" set of dry cells has undergone a process of evolution which has not stopped short of duplicating the entire system, the most striking examples of this being the use of two totally different systems as just referred to. Two sets of dry cells, an accumulator and dry cells, two sets of accumulators, magneto and accumulator and low tension magneto system and high-tension accumulator system would appear to aptly represent the steps that this essential has undergone in the past few years. In that time, reliability has been made an equally prominent characteristic of this as of other parts of the car, but experience has demonstrated that duplication is excellent insurance.

A. C. A.-A. M. C. M. A. SHOW TO BE EARLY.

As might be expected, the question of the New York show and the plans for the proposed Society of American Motor Car Engineers with the laboratory idea included, occupied most of the time at the Committee of Management meeting of the American Motor Car Manufacturers' Association, held at the New York City headquarters on Friday of last week.

It was announced that definite arrangements had been made with the Automobile Club of America, and the two organizations will work together on the show this fall, to be held as usual in Grand Central Palace. It was agreed that an earlier date than the December one of last year would be best, but no definite time has been decided upon. There are some good reasons for a show following the one at the Garden, coming between it and the Chicago affair, and there are some who think an affair at the same time as the Garden show would have many advantages. The matter will be taken up with all the members of the Association.

Proposals for the testing laboratory planned by the Association were received, but until further investigation nothing will be decided upon in that direction. The officials of the Association wish to investigate thoroughly the requirements of such a laboratory before coming to a decision.

A number of applications for membership were announced by the Membership Committee and will be subjected to the vote of the members.

There was a general discussion over the benefits of the proposed central bureau of good roads which the Association has voted to support both morally and financially.

The remainder of the day was taken up with routine matters. The new Show Committee which is to work with the Automobile Club of America on the show in the fall, consists of H. O. Smith, chairman; William Mitchell Lewis, and J. B. Bartholomew.

In attendance at the meeting were: Benjamin Briscoe, chairman, Maxwell-Briscoe Motor Company; Charles Lewis, Jackson Automobile Company; H. C. Smith, Premier Motor Manufacturing Company; E. F. Peer, Reo Motor Car Company; C. C. Hanch, Nordyke & Marmon Company; William Mitchell Lewis, Mitchell Motor Car Company; Roger J. Sullivan, Wayne Automobile Company, and Alfred Reeves, general manager.

PENNSYLVANIA TO GRANT RECIPROCITY.

PHILADELPHIA, April 1.—Local automobilists are delighted over the fact that after a long fight the House at Harrisburg, on Tuesday last, passed finally the measure providing for the recognition in this State of automobile licenses issued by any other State placing similar legislation on its statute books. They look forward to the time when it will be possible to pass all State boundaries without being compelled to change their tag outfits and select the proper license from the bunch in order to be ready in the event of hold-up by the "inspectors."

What with a universal license of $1,000,000 appropriated specifically for the improvement of the Philadelphia-Pittsburg trunkline road, Pennsylvania promises ere long to become the promised land of the automobilist.

DRIVER NOT RESPONSIBLE FOR BURSTING TIRE.

According to a decision of the Court of Appeal, of Lyons, France, an accident caused by the bursting of an automobile tire cannot be held to be imputable to the driver of the machine. Recently, on the road between Gex and Geneva, an automobile driven by a chauffeur in the employ of the Vanderbilt family, overturned, killing a man in its fall. The driver was condemned to six days imprisonment for having caused the death of the man by imprudence. In the higher court the decision was repealed on the ground that the bursting of a tire, which caused the car to overtrun, was independent of the will of the driver.

BAY STATERS FAVOR ANNUAL FEE.

BOSTON, March 30.—Rather a curious spectacle was presented this week at the State House when the automobilists appeared before the committee on taxation and were registered in favor of a bill to increase the registration fee for automobiles in Massachusetts by establishing a sliding scale based on horsepower with a minimum fee of $5 and a maximum of $15 for pleasure vehicles. Representatives of the Massachusetts State Automobile Association, Massachusetts Automobile Club, Bay State Automobile Association, Worcester Automobile Club, Springfield Automobile Club, and Automobile Owners' Association all told the committee that they were in favor of the bill, "with some changes." The changes which were suggested amounted practically to opposition to every phase of the bill. The speakers, nevertheless, were recorded as favoring the measure.

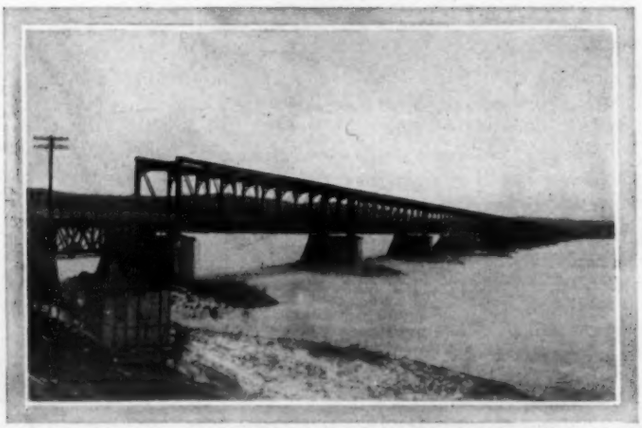
The Highway Commissioners say that because of the additional wear on the State roads occasioned by the increased automobile traffic they will need $50,000 extra appropriation this year for repairs. To obtain this money it is proposed to increase the registration fee, and the bill under discussion this week was the means to that end, it having been figured out that with a graduated fee from $5 to $15 the income would be sufficient to pay for the extra repairs required.

In their arguments in favor of the bill the automobilists pointed out first that the measure is impossible as it comes dangerously near being in the nature of a double tax on property, automobiles being taxed primarily in the communities where their owners reside; secondly, that the measure is unworkable, because it is impossible to determine exactly the horsepower of a gasoline motor, and to determine it with any degree of exactness would require much expense and detailed study of every one of the 13,000 or 14,000 machines in the State; thirdly, that the bill is inequitable, because it singles out one class of users of the highways only and makes them pay the bills, while all other users pay nothing; fourthly, that it is discourteous, because under it machines from other States could be driven in Massachusetts only two days without being registered here; and lastly, that it is unnecessary, as the automobilists are already contributing a large sum of money each year to the State treasury.

In place of the graduated fee provision of the bill the automobilists presented to the committee a sort of compromise. They admitted that automobilists use the State highways to a considerable extent, and that undoubtedly the additional traffic shortens the life of these as well as of other macadam roads in the State. Acknowledging this, they suggested that it would be fairer to all parties concerned if the law was changed so as to make the registration fee for an automobile annual instead of perpetual. At present the purchaser of an automobile pays a registration fee of $2 and this holds good until the machine is sold or worn out. It is estimated that with an annual fee of $2 for registration and the fees for operators' licenses, the State would receive an additional revenue of from $25,000 to $30,000, which, taken together with the usual income, would provide plenty of money for highway repairs.

The Highway Commissioners are in favor of the bill because it saves them from going before the Legislature and asking for a much larger appropriation, something which State boards do not like to do if they can help it. Under the bill all the fees paid in would go to constitute a State highway maintenance fund, from which appropriations would be made for highway repairs. The question was brought up at the hearing of how the park boulevards would be taken care of and the only answer was that if the automobilists were to be made to pay for them, the fees would have to be increased still more than proposed in the bill under consideration.

The hearing this week winds up the automobile legislation for this season as far as parties outside the legislative bodies themselves are concerned. The session has been fairly prolific in proposed measures, and the State Automobile Association's committee has been quite busy.



BRIDGE OVER SUSQUEHANNA THAT WILL BE DOUBLE-DECKED.

DOUBLE-DECKING LONGEST PENN. BRIDGE.

YORK, PA., April 1.—A big improvement for the autoist will be the double-decking of the big railroad bridge, which spans the Susquehanna river at Wrightsville. The bridge connects with Columbia on the Lancaster county side of the beautiful but unnavigable stream. For years the hundreds of auto tourists who use this bridge have been obliged to wait on the Columbia side for long periods while trains are passing on the low-grade freight line. The double-decking of the bridge will do away with all that delay and the autoist will be able to cross the bridge at any time and proceed on his way. The upper deck of the bridge will be used by the trolley, vehicles and autos. This leaves nothing but steam cars for the lower deck. The pedestrians will also use the upper deck. During the summer auto season it is not an uncommon sight to see scores of big touring cars cross this bridge in a day. This is the only direct route between New York and Philadelphia to the famous Gettysburg battlefield, just forty miles inland from the river.

The length of the bridge is 1.1 miles and while the majority of the tourists do not make any try at speed when crossing it, several drivers have covered the distance in less than two minutes. Nevin Hench, of this city, one of the youngest, as well as most daring autoists in the Keystone State, recently timed his run over the bridge, and made it in 1.36 minutes. The run was made in a Pope-Toledo, with three other occupants in the car.

Work is to be started on the double-decking of the big bridge at once. The woodwork arrived recently and the iron structural parts have been finished and shipped by a Connecticut firm. The recent announcement that the bridge was to be thus improved, by the Pennsylvania Railroad Company, was received with great interest by the autoists from this part of the State and others who have occasion to cross the Susquehanna at this point will also join in the general praise.

THE AUTOMOBILE IN MUNICIPAL SERVICE.

London authorities are hardly less interested in the use of the automobile for various duties previously performed entirely by horse vehicles than are private firms. The opposite illustration shows an electric police ambulance as used by the police authorities in the city of London. The transformation of vehicular conditions is proceeding at a more rapid rate in the British metropolis than probably any city in the world, owing to the advent of motor buses, motor cabs and special types of automobile vehicles. In Paris the automobile is now used by the municipality for collecting the contents of the household garbage cans, for watering the streets, for sweeping the streets, by the police and fire brigade, and as a hearse. Public transportation service in both London and Paris is now largely assured by gasoline vehicles, London being noted for 'buses and Paris for its motor cabs.

GERMANY'S VARIOUS CUP RACES.

BERLIN, March 25.—The Commission for the Imperial Cup race in June over a course in the Taunus has seen itself obliged to make decisive alterations in the route first chosen, as the long list of entries proved it too short for equal chances to be given to all starters, and as the idea of weeding out a whole row of cars did not find much favor a longer route has been settled on. This is from Kloster Thron to Homburg, Oberursel, Konigstein, Glastmetten, Esch, Niederems, Reichenbach, Riedelbach, Rod a. d. Weil, Emmershausen, Winden, Audenschmiede, Weilmenster, Luetzendorf, Ernesthausen, Essershausen, Weilburg, Euihaus, Gravenwiesbach, Usingen, Wehrheim, Kloster Thron. Each circuit—there are four in all—is about 125 kilometers in length.

The following alterations have been made in the Herkomer propositions: The Kesselberg and Forstenried rides will be timed in minutes, seconds and fifths of seconds. The Forstenried and Kesselberg rides will be valued by means of a table to be issued later in such a manner that should the car not attain or exceed the speed fixed for it as normal, it will be debited or credited 1-100 point in the flat and 1-200 point on the hill for every commenced 1-10 per cent. By equal points on the hill the result of the flat trials will decide and vice versa, or secondarily, the ballot.

The German Emperor has presented the German Motor Volunteer Corps with a cup for a long-distance race. His Majesty is more than ever interested in military automobilism, and the question of founding a standing motor car division in the regular army is being seriously discussed and is but a matter of time and red tape now.

FORMULAE ADOPTED FOR HERKOMER TOUR.

As a means of placing all the cars to enter the Herkomer Tour during the season on an even basis, the following formulæ have been adopted for the rating of the cars which take part in the deciding events of the tour, the speed trials in Forstenrieder Park and the Kesselberg hill climb:

X=10 H+43.5 Km/St

The foregoing is for the speed trials. For the hill climb the formula will be as follows:

X=6.3 H+21 Km/St

In both of which X=speed in kilometers per hour and H=the total cylinder volume in liters.

TEUTON ENTRANT FOR TOURIST TROPHY RACE.

For the first time in the history of the Tourist Trophy race a German car has been entered to compete. The seeker after honors is a German Mercedes and will have the distinction of being the first of its kind to start in the event.

ELECTRIC POLICE AMBULANCE USED IN LONDON.

WHY THE ROADS OF THE COUNTRY ARE SO POOR

WASHINGTON, D. C., April 1.—Logan W. Page, director of the Office of Public Roads, Department of Agriculture, recently submitted to a Congressional committee a very interesting summary of the work done and some reasons for the work done by that office. Among other things it is shown that the aggregate mileage of the public roads in the United States is approximately 2,300,000, not including Alaska and the island possessions. The total expenditures on these in 1904 approximated $75,000,000, of which about $15,000,000, or 20 per cent., was applied to permanent road work. In spite of this great outlay only 5.5 per cent. of the roads are surfaced with stone, gravel, or other hard material. It is evident, therefore, that enormous sums of money are annually wasted in the administration, construction and maintenance of roads, whereas the present outlay should, if properly applied, go far toward providing adequate transportation facilities in the form of improved roads, which are so necessary to our comfort and prosperity.

The United States is far behind Europe in this character of internal improvement, while excelling in most others. The causes may be generally stated as follows: Imperfect State laws; inefficient and improper administration and management of roads; ignorance on the part of local road builders of the principles and methods of road construction; ignorance of the qualities essential in road-building materials and lack of facilities for ascertaining such qualities; lack of sufficient research and experimental work to devise changes or improvements in road materials or existing methods of construction sufficient to meet peculiar conditions, reduce cost, or increase efficiency.

The remedies which should logically come from the National Government may be briefly stated as follows:

1. A general investigation, comparison, and explanation of existing road laws in order to provide legislators with all possible data upon which to consider improvements in existing legislation.

2. Investigation of systems of road administration and management and dissemination of the knowledge thus acquired with a view to the elimination of the worst features and the adoption of the best features in all parts of the country.

3. The introduction of proper methods of construction by familiarizing local road builders with the principles and practice essential to proper road construction and maintenance.

4. Investigation of quantity, location, accessibility, and relative value of road-making materials throughout the country and comparative tests to determine whether or not such materials possess the essential qualities.

5. Experimental and research work on a sufficiently large scale to cope with existing conditions and keep pace with the needs of the country in this direction.

All the remedies above suggested are of such character as would be capable of being realized to the fullest extent only through the National Government. For the States to carry on such work would involve a personnel, equipment, and operating expenses by each State almost as great as would be required of the National Government, with a great amount of duplication in methods and results, and much confusion owing to conflicting conclusions and recommendations. Furthermore, there is ample precedent for investigative and experimental work by the Government and much contemporary example of such governmental activity.

That the work already done by the National Government along the lines indicated in the above-suggested remedies has not produced greater results is due to the fact that the appropriations have been small and the facilities necessarily limited. For several years after the establishment of the office the appropriation remained in the neighborhood of $10,000 annually. The results achieved by the Office of Public Roads are much more than commensurate with the facilities provided by the appropriations of Congress, and have followed in general the procedure indicated in the remedies above stated.

HOW THE AUTO HELPS SELL LAND IN TEXAS

FORT WORTH, TEXAS, April 1.—Texas lands are in great demand at this time, and it has just been lately that the automobile has entered into the process of selling the lands to such an extent that many people have been buying lands farther out than anticipated, because the automobile has covered the distance from the railroad station to the property in less time than the buyer has been accustomed to riding.

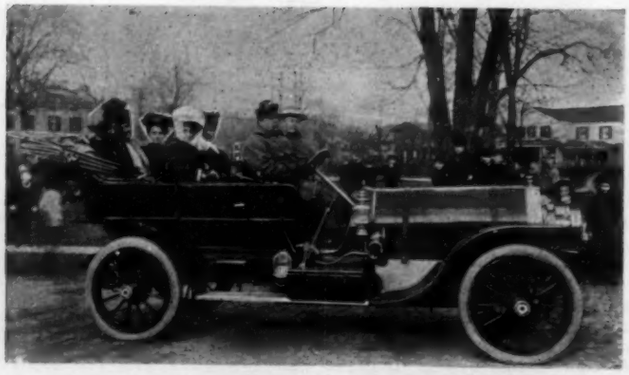
A syndicate of New England men are reported to have bought a large tract of land in the Panhandle, and are selling it off to settlers for farms. The New Englanders, so the story goes, are wealthy men and have not only come down to their lands, but have brought their families and a lot of speedy automobiles. The ground is perfectly level in that section of the State and is ideal for automobiling. When a train load of land seekers arrives, these thrifty New Englanders have their autos at the station, and, with their nicely dressed people, it gives the place a gay and attractive appearance to the tired travelers after their long and wearisome ride through Kansas and Oklahoma. One of these visitors gives the following experience:

"We arrived at the station in the morning, and a gentleman stepped up and asked me if I was looking for a farm. I told him I was. So he invited my wife and myself to get in his auto and he would show us a few of the tracts in that vicinity. We started off smoothly and rapidly, and as we rode along our host pointed out various nice farms they had sold and talked about the various soils, keeping us well interested. Finally we reached a tract of splendid farm land, which just suited us, and we bargained for it right there. We sailed back to town, reaching there in time for an early dinner, having had a most pleasant morning ride. I bought the land and was well pleased.

"I thought my land was fifteen or sixteen miles out, as it had taken so little time to get there. The day before we had planned to leave I hired a team to ride out and see the place again, taking my wife with me. We started in the morning and never reached my farm until the third day, and it required three days more to return to the railroad station. The automobile had gone so smoothly and rapidly at a fifty-mile an hour gait that I had bought a place seventy miles from town, thinking that it was only sixteen miles out. If that is not a Yankee trick I never heard of one."

Texas is a State of magnificent distances and seventy miles in the Panhandle country is looked upon as a very immaterial proposition. The roads are so good that teams can travel long distances in a day's time, and it is not an uncommon thing for a buggy to cover 100 to 125 miles in a day and automobiles very many miles more.

These thrifty New Englanders have, however, hit upon a brand new scheme and one that is calculated to work the unwary. The automobile ride is so exhilarating in the pure ozone of that section that all sense of distance is completely lost. The victim thinks nothing of the short ride necessary to carry him to his new possessions until he changes gasoline power for horse. Probably in no direction has the automobile made its worth more manifest than in connection with the increase of real estate values.



GEARLESS 'GREAT SIX" SIX-CYLINDER, 75-HORSEPOWER.

SUBSTANTIAL GAIN IN FEBRUARY EXPORTS.

During the month of February past, the value of the automobiles and parts exported increased to the extent of $110,000 over the same month in the year previous, the figures being $332,713 and $443,703. The latter sum represents 213 complete automobiles, making the average value approximately $1,725, and $75,394 worth of automobile parts. This substantial jump in the totals for the shortest month of the twelve in 1906 and 1907, amounting as it does to a 33 1-3 per cent. increase, is mainly to be accounted for by the showing of the United Kingdom, which increased from $49,035 to $100,065; France, which rose from $9,495 to $33,942; Mexico, from $21,331 to $96,262, and British North America, from $34,507 to $75,206. For the period of eight months ending February in the past three years, the figures are as follows: 1905, $1,402,775; 1906, $1,771,313, and 1907, 1,582 automobiles valued at $2,471,859, and parts, $401,387. The detailed report is presented herewith:

	February.			Eight Mo. Ending Feb.		
	1906		1907	1906		1907
Automobiles and Parts of—	Dollars.	No.	Dollars.	Dollars.	No.	Dollars.
Automobiles No..	332,713	213	368,309	1,771,313	1,582	2,471,859
Parts of			75,394			401,387
Exported to—						
United Kingdom..	49,035		100,065	471,017		663,023
France	9,495		33,942	123,191		211,605
Germany	4,505		4,136	35,329		71,807
Italy	69,116		30,278	131,210		99,103
Other Europe.....	22,655		18,926	90,252		106,687
British N. Amer..	34,507		75,266	284,623		571,360
Mexico	21,331		96,262	166,510		561,335
West Indies and Bermuda ..	105,535		58,366	210,428		158,409
South America ..	7,551		6,260	48,041		137,641
Brit. E. Indies ..	4,215		183	28,364		21,325
Brit. Australasia..	1,481		15,101	118,846		184,678
Other Asia and Oceania.....	1,164		2,810	30,910		69,476
Africa	695		1,153	20,875		8,555
Other countries ..	1,428		955	11,717		8,242
Total automobiles, and parts of....	$332,713		$443,703	$1,771,313		$2,873,246

MEDAL OF HONOR FOR AMERICAN INVENTORS.

At a recent meeting of the Executive Committee of the American Institute of Social Service, it was announced that the *Scientific American* had offered a gold medal to be presented annually by the Institute to the inventor of the best device for safeguarding life and limb. An Advisory Committee of the editors of the chief technical papers was organized to co-operate with the Institute in the work of protecting life and limb. As at present constituted, the Advisory Committee consists of fourteen representatives from the *Scientific American, Iron Age, American Machinist, Railway and Locomotive Engineering, Automobile, Electrical World, Street Railway Journal, Dry Goods Economist, Electrical Age, Railway Gazette* and *Engineering and Mining Journal.*

NO CHANGE OF A. L. A. M. POLICY.

E. H. Cutler, who as chairman of the Executive Committee has been given the active management of the Licensed Association, recently gave out a statement relative to the policy of the association. In part he said:

"There will be no radical changes made under the new regime; the same general policy carried out so ably by Mr. Day will be followed. The purpose of the association to co-operate in every way for the mutual advantage of its members and users of automobiles will be adhered to. To promote confidence in the industry and conserve the interests of those connected with it, through the efforts of its various departments, will be an objective point. The Mechanical Branch, which has done so much for the welfare of the industry, as the cars produced under its standards and specifications attest, will be given every possible assistance by the management of the association; so with the other departments, the traffic, agency, and advertising. The Selden patent, the basic patent which, as everyone knows, covers broadly the manufacture, sale or use of the gas engine for road locomotion, must not be lost sight of in the magnitude of the work being done by the association, and the prosecution of the case which has commanded not only the attention of the entire automobile world, but that of many other industries, will be carried on as rigidly as heretofore. The conduct of a case so voluminous must necessarily be one that would seem slow to those not in close relation to it, whereas its procedure has been steady and persistent. Last summer testimony was taken right through the months of July and August, with no let-up for vacations. It was even taken up to Christmas eve and resumed the day after Christmas, something most unusual in patent litigation."

Mr. Cutler seemed enthusiastic over the early show situation, saying: "From every indication forthcoming shows will prove very interesting; the time seems opportune for the manufacturers to exhibit their products early enough to guarantee early spring deliveries. The licensed dealers have confidence in their factories output and can get their orders in early for special specifications, thus affording the manufacturers an opportunity to produce without working their factories to the limit of their capacity."

ENGINEERING BUILDING TO BE DEDICATED.

Quite an elaborate program extending over two days, Tuesday and Wednesday, April 16 and 17, has been outlined for the dedication of the Engineering Societies Building, which has been erected in New York City by Andrew Carnegie and presented as a gift to the associated engineering societies of New York. The exercises will include a number of addresses.

PEERLESS AND POLAR BEAR RUB NOSES IN DETROIT'S PARK.

GERMAN ALCOHOL EXHIBIT AT JAMESTOWN.

WASHINGTON, D. C., April 2.—Germany will send a large and comprehensive collection of apparatus employed in the production and consumption of denatured alcohol to the Jamestown Exposition, which opens April 26. This fact was conveyed to Dr. Charles E. Monroe, professor of chemistry of George Washington University in this city, who was recently appointed superintendent of the free alcohol exhibit at the coming exposition, in a cablegram from Charles Lesimple, honorary commissioner of the exposition for Germany.

The German exhibit was secured through the co-operation of a number of leading German manufacturers. As is well known, Germany adopted the policy of tax-free denatured alcohol for industrial purposes several years ago, and has led all European countries in its utilization for light, heat and power purposes.

Professor Monroe is advised that the collection of German apparatus will include the small stills, of which seven or eight thousand are now in use among the farmers of Germany; internal combustion engines, which are employed largely throughout Germany, and other classes of machinery employing denatured alcohol. Supplementing the German collection will be numerous American devices for the consumption of alcohol, including automobiles and motor boats. The alcohol exhibit at Jamestown should prove very interesting and instructive.

MORRELL ON A. C. A. ENDURANCE RUN.

Referring to the proposed endurance run to be conducted by the A. C. A. during the coming summer, Chairman Robert Lee Morrell, of the Contest Committee, comments in this vein:

"I cannot speak for the committee, but my idea would be to require the cars to make a hard day's run, perhaps from New York to Albany, half a dozen times. One day they would go to Albany and the next day return to this city and then repeat the operation. That would mean a trip of nearly 150 miles a day. Perhaps it would be advisable to have a control established at Poughkeepsie, but I would suggest that before starting the bonnets and gear boxes of the cars should be sealed, and if a car broke down between the controls it would be out of the contest. A run of this sort would show the real endurance qualities of the motors and it would be a test that would demonstrate the reliability of the car for continuous daily runs beyond question."

Recently Chairman Morrell, following the lead of W. E. D. Stokes, tendered the use of his car to Magistrate Crane for one day each week. Not long ago, when the chauffeur of Mr. Stokes was being tried before the magistrate, the owner of the car offered to supply it weekly for convalescent hospital patients, the assignment to be made by Magistrate Crane.

PITTSBURG SHOW WILL OPEN APRIL 8.

PITTSBURG, April 2.—Great hustling is being done to get the Duquesne Garden ready for the automobile show which opens next Monday night, April 8, and continues until Saturday night, April 13. Never before was the Garden so elaborately decorated for an exhibition of any sort. The setting will be green and white, and the whole hall will blaze with electric lights set in a great variety of figures. From the main entrance one will obtain first a view of long lines of cars from the stripped, polished chassis to the most elaborate limousine car, all the colors known to the coachmaker being observed. On three sides of the regular skating surface of the Garden will be ranged small stands for the display of accessories, leaving the boxes open for the public.

GLIDE MACHINE FOR VANDERBILT RACE.

Announcement has been made by the George J. Scott Motor Company, New York agents for the Glide car, that a special Vanderbilt Cup racer is being built at the factory to represent the firm in the great October race. The machine will be four-cylinder, have shaft drive, and develop about sixty horsepower.

AUTO CABS PROMISED FOR NEW YORK.

The automobile taximeter cab is coming nearer. A few months ago the New York Transportation Company purchased one of the Renault cabs fitted with distance-recording and fare-indicating device used so generally in Europe, and placed it in service at the Café Martin. According to Richard W. Meade, the president of the company, more gasoline machines will be put into commission shortly, all equipped with the taximeter. It is not stated whether the machines will be similar to the one now in service or not, but it is certain that they will have the taximeter, and this after all is the only thing the public is concerned about.

C. W. Kelsey, general manager of the American Cab and Express Company, states that he expects to have gasoline taximeter cabs in use in New York within six months. Walter Christie is also interesting himself in the cab business, and is now busy designing a 20-horsepower, four-cylinder, front-drive chassis for this class of work. All parts will be made at outside factories, only the assembling being done at the Christie works. The first batch will consist of two hundred machines. The taximeter system will, of course, be adopted.

CONDITIONS OF THE 1907 EUROPEAN RACES.

GRAND PRIX: 500 miles in one day. Fuel consumption limited to 6.6 gallons per 62.1 miles. Competitors provide their own fuel of whatever nature they desire. No weight limit or other restrictions. Teams of three from any factory. All work on racers to be done by driver and mechanic.

SPORTING COMMISSION CUP: 300 miles in one day. Fuel consumption, 3.3 gallons per 62.1 miles. All other conditions same as Grand Prix. Will be run at same time as Grand Prix.

ARDENNES CIRCUIT: 375 miles on short circuit, to be finished within eight hours. Cylinder capacity limited to 8 liters. Minimum weight, 2,585 pounds, including racing body and tires, but without tools and spare parts. Gasoline of .69 degrees will be supplied by racing board, no limit on amount.

GERMAN EMPEROR'S CUP: 300 miles. Maximum cylinder capacity, 8 liters. Minimum weight, 2,585 pounds, including racing body and tires, but without gasoline, oil, water, or spare parts. Teams of three from any factory.

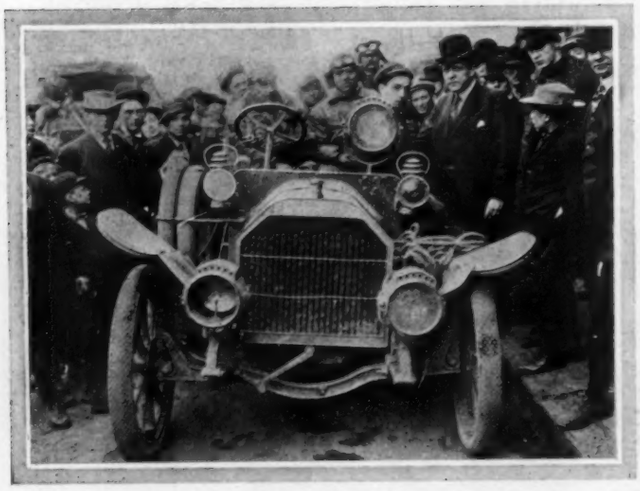
TARGA FLORIO: 282 miles over hilly, 94-mile circuit. Four-cylinder engines; bore between 120 and 130 millimeters; weight limit, 2,200 pounds for the minimum bore. Six-cylinder engines; weight allowance, 2,200 pounds for 85 mm. bore; increase of 88 pounds for every additional millimeter bore. Teams of four from any factory.

TWO DAY RUN OF HARRISBURG CLUB.

HARRISBURG, PA., April 1.—Preparations for the two days' run of the Motor Club of Harrisburg are progressing finely, the Exhibition and Runs Committee having drawn the rules for the affair and selected the route. The run will leave Harrisburg on Monday morning, May 6, between the hours of 7 and 7:30 o'clock, and will proceed to Lebanon, Lancaster, Columbia, and thence to York, where the night control will be established. The following morning the cars will leave York and proceed to Hanover, Gettysburg, Chambersburg, Shippensburg, Carlisle and back to Harrisburg. Each day's run will cover about 100 miles. R. H. Johnston, of the New York Motor Club, will bring his car to this city and act as pilot on both days of the run. E. C. Johnson, of the Quaker City Motor Club, will act as referee.

SCOPE OF SOCIETY OF AUTO ENGINEERS.

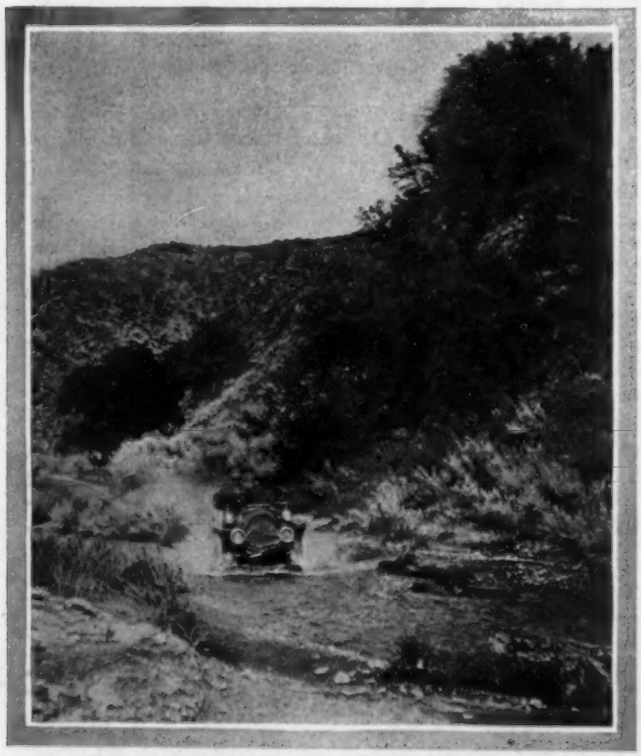
Though nominally it appears to be affiliated with but one school of engineering, due to the wording of its title, the Society of Automobile Engineers is, on the contrary, one of the broadest in scope and one of the most independent, as it has no connection with any other association. Article 1A of its constitution defines the word automobile as used in the title of the society. This is as follows: "Definition:—The term "automobile" as used by this society is intended to cover any self-propelled vehicle operating on or under the surface of the earth or water, or in the air."



RALPH OWEN AND THE OLDSMOBILE WINNER OF SAN FRANCISCO-LOS ANGELES RACE.

OLDSMOBILE TRIUMPHS IN $6,000 RACE.

Los Angeles, March 30.—Owing to the execrable state of the roads the much-talked-of contest between the Oldsmobile and Pope-Hartford cars that was to have taken place on the 14th was postponed to the 28th; and although the roads were not in much better condition than previously, the contestants decided to start. The race is the result of rivalry of long standing between E. P. Brinegar, of the Pioneer Auto Company, San Francisco, and H. D. Ryus, of the Pope-Hartford agency in Los Angeles. Mr. Ryus piloted the Pope-Hartford and Ralph Owen, of "Mudlark" fame, the Oldsmobile. The latter won the toss and chose the later start, so that the Pope-Hartford left at 5 A. M. and the Oldsmobile half an hour later.



H. D. RYUS AND POPE-HARTFORD FORDING A STREAM EN ROUTE.

Owen was heard from first at Bakersfield, announcing that he had passed Ryus about fifty miles out. The latter was not heard from again, and it turned out subsequently that the car had hurdled an embankment and broken its rear axle. For the first half of the distance of 500 miles, the roads were in an almost impassable state, and on two different occasions it was necessary to extricate the Oldsmobile from the mud with the aid of teams, the rear wheels having almost disappeared.

A MATCH RUN BETWEEN TWO FLORIDA CITIES.

By WANDERER.

Jacksonville, Fla., April 1.—Ralph Owen's New York-Ormond tour has aroused in Florida drivers an ambition to make the run between Jacksonville and St. Augustine quite frequently, although the highway is of the common sandy variety and about as hard a piece of road to tackle as one can find.

Mr. Hutto, the Cadillac agent in Jacksonville, recently drove his single-cylinder the forty miles between the two cities in 2 hours and 40 minutes. The time was not generally credited, but that Mr. Hutto made it was proven beyond a doubt by his performance in a match run of the other day. While the Ford made the distance in 2 hours 17 minutes, Mr. Hutto was only 13 minutes behind him.

L. C. Oliver, the Ford agent, recently came out with an advertisement stating that he would match the six-cylinder Ford against any car in Jacksonville for any kind of test. Mr. Hutto took up the challenge. He is a native product, and the majority of the people believed that the Florida "cracker," through his knowledge of the country, would defeat the Ford. The betting, of which there was considerable, placed the little Cadillac in favor, all conditions of the match giving the Cadillac the best of it; for, if he won, it would mean a great deal to the agent, and if he lost there would be no disgrace attached to it, as it was a 6 to 1 proposition in favor of the Ford. Many believed that the Ford would get in trouble through its speed, and that the driver would either break some part of the machine through striking a tree or hitting the uneven places.

The writer, with Manager Morris of the Windsor Hotel, went out in a Maxwell runabout to South Jacksonville and was stationed at the end of the hard road which terminates about two miles south of where the sand road begins. The rivals started at 9 o'clock sharp and we soon heard the roar of the Ford, which was coming along at about fifty miles an hour. The machine had been stripped of its big tonneau, and an extra tank of water had been placed in the rear, feeding to the water cooler. This was a wise precaution, as it is doubtful if any water could have been found on the road in case the original supply should boil out. The Ford driver slowed down to about forty miles when he struck the deep sand, but that was too fast, as the machine bounded from side to side, and barely escaped hitting a two-foot water oak. The "Commodore" and driver were ready to jump, and the spectators ran back into the woods, expecting a disaster. On regaining his steering control, by which time he had slowed his engine down, the driver straightened out the machine, struck the center of the road, and the last seen of him he was making good progress, with the sand falling from the chain wheels.

About two minutes later Hutto, with his steady-going Cadillac, hove in sight. He did not follow the Ford, but took a road to the left, which he had tried the day before.

At half distance the Ford passed 1½ minutes ahead of the Cadillac. The spectators there stated that the Cadillac was cutting off the corners and not keeping to the road where it was bad. Later on the Ford broke a spring, and Hutto passed his rival, who, however, soon made his repair, caught, and passed the little machine, reaching St. Augustine 13 minutes ahead.

The race aroused considerable enthusiasm, and now the cry is for hard surface roads, which I believe will come in the very near future. The Cadillac agent desires another trial, but wants the Ford to be equipped just as it is sold from the shop, without extra water tank, and with the tonneau on.

HENRY FORD ON VANADIUM'S WORTH.

"Vibration—fatigue—crystallization; how many persons glibly use these terms and how few really appreciate their tragic import," said Henry Ford, in discussing the reasons for the application of the rare element, Vanadium, in the making of special steels for motor car construction. "Yes, tragic is the word. Few people realize how many accidents, otherwise unaccountable for, are due to the ravages of vibration and the consequent fatigue of the metal—a popular term for which is crystallization. An axle, a spring, crankshaft, frame, or any other part that has gone through months, possibly years, of rigorous work and withstood many a shock without showing any weakness, snaps like glass some fine day when there is no apparent cause for it. To the average engineer versed in the problems of other branches of mechanics this is a mystery, but the automobile engineer has long since learned the reason, and his chief concern has been to find a metal that would resist the ravages of this insidious enemy of the motor car. The quality of resisting repeated shocks, alternating stresses and vibratory action is termed 'dynamic.' And a steel which possessed the necessary dynamic properties to withstand fatigue to almost its ultimate breaking point and yet finally yield under the severest shock or stress without fracturing was the goal of our metallurgists. To obtain this result we must increase the dynamic properties without sacrificing the static qualities—must double the elastic limit and yet maintain, or increase also, the tensile strength of the metal.

"There was but one element known to metallurgy that would accomplish this end. That was Vanadium, a mineral so rare, its interest to steel specialists up to this time has been academic only. Happy circumstance has now placed it within our reach. A large deposit of the hitherto commercially unobtainable mineral has been opened up in South America, and Vanadium steel can now be made—in fact, we are making it—at about the same cost as the best grades of nickel-steel, to which latter it is incomparably superior in the properties above indicated."

AUTO TRADE AT THE HUB.

BOSTON, April 1.—Since the close of the automobile show there has been much activity among local dealers, taking care of the business that was worked up during show week. The Dodge Motor Vehicle Company, representatives of the Pope cars, the exhibit of which was the largest made by a single firm at the show, has this week delivered all the nineteen cars that were shown to their owners.

Since the show a number of local firms have moved into new quarters. Among these is the A. E. Morrison Company, agents for the Stearns and Oldsmobile, which has taken possession of its new show and sales rooms on Massachuetts avenue, near Commonwealth avenue, and now has one of the finest show rooms in New England. The quarters which the A. E. Morrison Company left on Massachusetts avenue have been occupied by the Matheson Company of Boston, of which Roy A. Faye is manager. The show rooms of the Henshaw Motor Car Company, agents for the Haynes and Columbus electrics, which are in the same building as those of the A. E. Morrison Company, are not quite completed, but will be ready for occupancy in a few days.

In the past few days, also, a new automobile district has been opened up on Huntington avenue. In the garage of the Back Bay Automobile Company, just above Mechanics' Building, the Buck & Price Company, agents for the Rainier, and the H. C. Stratton Company, agents for the American Mercedes, Car De Luxe and Kissel Car, are now located. The new agency of the Darracq is also on Huntington avenue, and with the opening of the Copley Square garage on Irvington street, near Huntington avenue, it is expected that several other firms will move into this section. There is a marked tendency to get away from the older automobile section on Columbus avenue, and as fast as buildings can be erected in the Boylston street and Massachusetts avenue section they are being snapped up for automobile stores.

THE GLOBE-GIRDLER PUNCTURED A BOOST.

This story is by Robert W. Spangler, a Chicago auto scribe:

Charles J. Glidden, the globe-girdling autoist, was last week in Chicago, and one day was a guest of C. A. Coey at the Auditorium Annex for luncheon. Mr. Coey resides at the Annex, and consequently is well known to the employees. One of these is Prince Smile Arajh, of India, whose white suit and dark complexion distinguish him from the other head waiters. Seeing Mr. Coey dining with a stranger, and thinking he was perhaps a prospective customer for a Thomas Flyer, the Prince approached the table, apologized for intruding, but said he wanted to tell Mr. Coey that the half-dozen Thomas cars which he had shipped to India were giving perfect satisfaction in the royal household. To strengthen his statement he produced a post-card photograph showing, so he said, a number of the royal family in one of the Thomas cars. This card he exhibited very impressively to Mr. Glidden, who smiled faintly as he looked at it, but said nothing. The Prince then made a few more remarks in praise of the Thomas cars, and left the vicinity of the table. Turning to Mr. Coey, Mr. Glidden said:

"Your Indian friend is certainly a good advertising medium for you, but he overreached himself that time. The picture he showed us was one I took of my car in India last year."

TRADE IS LIVELY IN PHILADELPHIA.

PHILADELPHIA, April 1.—At an informal dinner at the Hotel Majestic last week, at which President Thomas, of the E. R. Thomas Motor Car Company, of Buffalo, was the host, the announcement was made that the Thomas Flyer and the Thomas Forty would be handled in Philadelphia hereafter by the United Motor Car Company, of which H. A. Dawson is president and A. H. Dorsey vice-president and general manager. The Thomas cars were formerly represented here by Martin & Hart at 215-217 North Broad street, where the new concern will continue the Thomas headquarters.

The largest automobile accessories establishment in this city—the Auto Equipment Company—opened up at 144-146 North Broad street last week. Morris Penrose, former manager of the local branch of the Fisk Rubber Company, is at the head of the new concern.

The new garage of the Foss-Hughes Company, now rapidly approaching completion at 221-223 North Watts street, will be run on the club plan, all its facilities being placed at the disposal of Pierce-Arrow, Cadillac, and Baker electric owners for limited periods free of charge.

To-day marked the opening of the first public auto express company in this city. Its official title is "The Auto Express and Trucking Company," and two vehicles were started this morning. The two vehicles put to work to-day were three-ton and two-ton trucks, built by the Reliance Motor Car Company. It is announced that the service charges will be from 25 to 50 per cent. lower than those at present in force, and that the business is bound to increase.

IMPORTERS NAME COMMITTEE TO CONFER.

At the meeting of the Importers' Automobile Salon, which was held during the latter part of last week, the consensus of opinion was general that with the Licensed Show occurring in the early part of November a showing of imported cars at a later date would be imperative. A committee consisting of E. R. Hollander and C. R. Mabley was appointed to take up the matter with the Association of Licensed Automobile Manufacturers, whose contract with the Garden precludes the holding of automobile shows in the latter not sanctioned by that body. Officers for the ensuing year were elected as follows: President, J. S. Josephs (Rochet-Schneider); vice-president, E. R. Hollander (Fiat); treasurer, C. F. Wyckoff (C. G. V.); secretary, S. B. Bowman (Clement-Bayard); directors, the officers named and C. R. Mabley (Isotta-Fraschini). An aggressive policy for the year was decided upon.

ACTIVITIES AMONG THE GARAGES.

Large Garage Under Construction at Auburn, N. Y.

Work of construction has been begun on the new garage at Auburn, N. Y., which will be occupied and operated by the Auburn Automobile Company, and which, when completed, it is said, will be the largest garage between Albany and Rochester, and one of the largest in the State outside of New York City. The building, which is to be of brick and concrete, will be entirely fireproof. It will have a frontage of 180 feet and a depth of 60 feet. It will be one story in height, and will occupy the plot of ground extending from the corner of Green and Water streets west, nearly to Hulbert street. The machine shop will be at the west end of the building, 30 x 60 feet. At the east end will be the offices, and a waiting room for ladies, also a reading room for chauffeurs off duty. The store room, or garage proper, will occupy the remaining space, and will be 130 x 60 feet. Here fifty cars can be accommodated at once, and there will be a row of stalls wherein cars may be locked by their owners to insure privacy. An important feature of the proposed building is that the roof will be supported by arched girders, so that there will be no posts in the building to interfere with the movements of the cars. The building will be ready for occupancy about the middle of May.

Centrally Located Garage for Minneapolis.

An edition de luxe of the modern automobile garage is to be built one block from the Plaza Hotel, Minneapolis, Minn., which is headquarters of the Minneapolis Automobile Club, by Joseph J. Barclay, of the Barclay Auto Company. It will stand at the junction of Huron street and Hennepin avenue, on land belonging to L. S. Gillette. The garage will be built at once, and will be of fireproof construction, with an exterior of white sand lime brick. Steel will be used to support the roof and leave the interior clear. The basement will be full size, with two stories above. The building will cost $30,000. The ground dimensions are 90 feet on Hennipin avenue and 115 on Huron street. The first floor of the new Barclay garage will be divided into two sections. The upper 35 feet will be used for cars and the 51 feet lying on Huron street for the main garage. The entrance will be from Hennepin avenue.

Modern Garage Under Construction at Geneva, N. Y.

The work of demolition of the old Maynard house at 143 and 145 Castle street, Geneva, N. Y., has been commenced to make room for the Geneva Automobile Company's garage. The building will be two story brick, connected with the present building in the rear, making the new home of the company 132 feet long and 40 feet wide. The estimated cost of the improvements will be about $7,000. A double track will make it possible for a car to enter the building from either Castle or Main streets and pass out again without turning round. Near the main entrance will be a fifteen-foot turntable. The second floor of the building will be fitted as a clubroom with toilet and wash room adjoining.

A $200,000 Garage for the City of Pittsburg.

The Standard Automobile Company, of Pittsburg, Pa., will soon break ground in Aiken avenue for a six-story fireproof garage, 100 x 150 feet. The structure will probably be of the new reinforced concrete type, and will cost with the fixtures and machinery $200,000. President W. N. Murray expects that the big garage will be ready for use in the fall. Mr. Murray was one of the pioneer automobile dealers in Pittsburg, having entered the field in 1900 as a partner in the firm of Seeley & Murray. The Standard now occupies a series of buildings at Baum and Beatty streets, and for two years its business has been far in excess of its convenient capacity for handling it.

Washington's New Garage Will Accommodate 40 Cars.

The new automobile garage of the Capitol Hill Garage Company, at 615 B street, southeast, Washington, D. C., is now nearing completion. The new building, which will accommodate forty vehicles and be modern in every respect, is the only one within a mile of the Capitol. J. J. Flynn has purchased the interest of H. T. Acre and is now sole proprietor of the company.

GARAGE DOINGS THE COUNTRY OVER.

Philadelphia.—Charles G. Henderson is building a one-story garage, 474 by 130 feet, at Philadelphia, on Fifty-first street, north of Westmoreland street. The cost will be $8,000.

Zanesville, O.—F. A. Clark, proprietor of the Buckeye garage, has arranged for the erection of a handsome one-story brick and concrete garage on Eighth street, Zanesville, O.

San Diego, Cal.—Work has been begun on a new automobile garage for Horace B. Day at 1144 First street, San Diego, Cal. The total cost of the new structure will be about $6,000.

Buffalo, N. Y. Volney P. Kinne has filed plans in the Bureau of Building which provide for the construction of a two-story brick garage at Nos. 1114 to 1118 Main street. The garage will cost $14,000.

Thomasville, Ga.—A good-sized garage is to be established in this place by William Miller, which will be in readiness within a month. Thomasville is getting the auto fever in a pronounced manner, and a modern garage will be welcomed.

Detroit, Mich.—Robert L. Fee will build a garage to be devoted exclusively to the use of electric automobiles on the south side of Jefferson avenue, just east of St. Antoine street. The garage will be operated under the name of the Fee-Vincent Company.

Evansville, Ind.—After remodeling, the Dyer block at 320-322 Upper Fourth street, Evansville, Ind., has been occupied by the three Fellwock Brothers as an automobile salesroom and garage. The title of the new business will be the Fellwock Automobile and Manufacturing Company.

Columbus, O.—A new garage will shortly be opened in this city by John Field, manager of the Columbus clearing house, and A. C. Kyle, of the Broad-Oak Company. The garage, which will have all modern appliances, including an electric charging plant, will be on the ground floor of the Broad-Oak skating rink.

Waterloo, Ia.—The Summit Carriage Mobile Company has just opened a garage and factory at 512 Lafayette street, Waterloo, Ia. E. D. Cadwell is in charge of the plant. W. W. Eggers has also opened an up-to-date garage in this city, and contracted with the Bartholomew Company, of Peoria, Ill., for twenty of its large Glide touring cars.

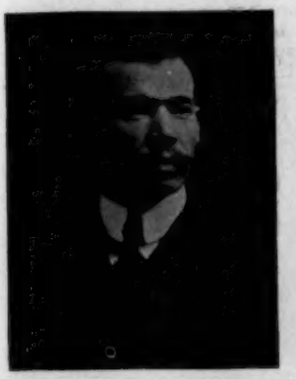
Minneapolis, Minn.—Evans Motor Car Company, now located at 719 First avenue, South Minneapolis, Minn., is building a new garage, 50 by 125 feet, on Hennepin avenue, between Fifteenth and Sixteenth streets, which they will occupy when completed. Agencies for Mitchell, Wayne and Jewell cars have been secured for 1907.

Avon, N. J.—Located about midway between the two popular summer resorts, Belmar and Asbury Park, N. J., the garage just completed and to be managed by John Thompson, at Avon-by-the-Sea, should be a convenience to summer tourists. The new building is located at the corner of Main street and Sylvania avenue, is 50 by 100 feet, and will be fitted with a charging plant for electrics.

Pittsburg, Pa.—H. H. Marks, of New York, has purchased from H. M. Aronson the five-story brick building in Henry street, Oakland, formerly occupied by the Oakland Livery Company, for $90,000. The building has over 40,000 square feet of floor space. The purchase was made with a view to fitting up the big structure for the largest automobile garage in this State. It is reported that it will be the headquarters for the Rainier car, and that a big storage plant will be arranged also. A. L. Richmond, Jr., owner of the Hotel Lincoln, is said to be interested in the venture.

LONGERON, BUILDER OF MANY RACING CARS.

Working unostentatiously away at the plant of the E. R. Thomas Motor Company, at Buffalo, is a man who has superintended the construction of more prize and cup winning motor cars than any other in the world to-day. The man is Michael Amide Longeron, and, although the greater part of his work lies with the regular production of stock cars for the Thomas company, he is at present engaged in superintending the work of remodeling and tuning up the three 115-horsepower racing cars that will be entered in the Vanderbilt Cup race this fall.



MICHAEL AMIDE LONGERON.

His racing car experience commenced in 1895, when he constructed the cars that won the great Paris-Berlin, Paris-Bordeaux, and Paris-Toulouse races, and the Tour de France. In addition to these he has since constructed the cars which in 1904 and 1905 won the French elimination trial for the Ardennes cup, the Taunus cup, the French elimination trial for the Auvergne cup, and the Auvergne cup itself, and in both those years the French elimination trials for the Gordon-Bennett cup race and the Gordon-Bennett races proper. That list is in addition to a number of minor events held in Europe.

Last year he constructed the three Thomas cars, one of which led the American team in the Vanderbilt Cup race and now has the work of fitting those machines, "green" at that time, for the two events in which they will participate on Long Island, the American elimination trial and the cup race proper.

NEWS FROM THE CITY OF THE MAUMEE.

TOLEDO, O., April 1.—Toledo automobile dealers consider their first attempt at holding an automobile show to have been so much of a success that they have already announced that another show will be held next year on greatly enlarged and much more elaborate plans. In addition to the display of cars, marine engines, oils and accessories, airship *Toledo No.* 1, was on exhibition, while Roy Knabenshue, Toledo's noted aeronaut, made explanations. A band of thirty pieces was present throughout the show and an opening address was made by Mayor Brand Whitlock. Noteworthy was the interest taken in the show by country people, who in many instances traveled miles to see the show, and whose interest marks an advance for the industry.

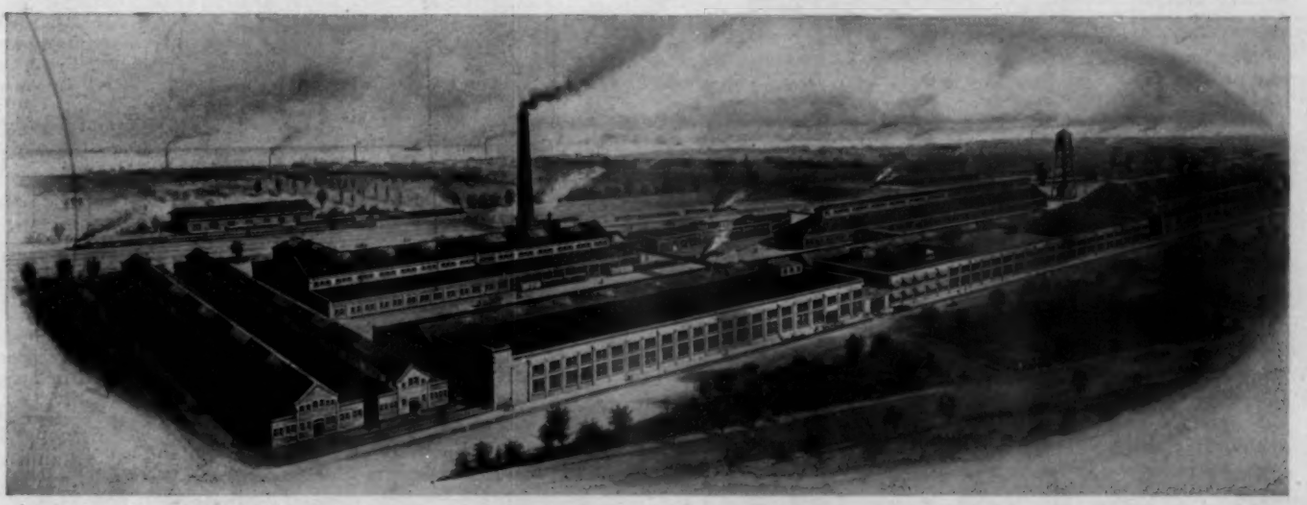
Monroe, Mich., a small town some twenty miles north of Toledo, is agog over the visit of a number of strangers, who spent some time there during the past week looking for available sites for the announced purpose of erecting an automobile factory. While mention was not made as to what concern was represented, enough was stated to lead to the belief that they represented some operating plant which is looking for a site away from the larger cities, where labor unions are likely to cause trouble.

The Toledo Storage Battery Company is placing a new battery for automobile owners on the market. Its first public appearance was at the Toledo automobile show last week.

The new city ordinance requiring automobile owners to display numbers in a conspicuous place on their machines goes into effect April 1, and there is now a grand rush on the part of owners to comply with the new law, which is the final outgrowth of a fight covering several years.

GROWTH OF A MODERN AUTOMOBILE PLANT.

Starting originally with an ordinary factory building of small dimensions in the east end of Cleveland, the Winton Motor Carriage Company has, in the course of a comparatively small number of years, even as such things go in the automobile industry, developed one of the largest and most complete plants for the manufacture of automobiles to be found in this country, or even in the world. It was not long before the original facilities mentioned, consisting of the former plant occupied by the Brush Electric Company, were outgrown, so that as far back as 1902 the beginnings of the present plant on the Berea Road in the outskirts of the Forest City were undertaken. With an eye to the future development that followed so quickly, a large tract of land was purchased on the line of the Lake Shore and Michigan Southern Railway. The first buildings erected were the powerhouse, foundry, machine and paint departments and the shipping room. Though the latter were occupied for the first time in the fall of 1902, the following year saw the erection of new buildings to house the assembling and repair departments and the woodworking shop. At that time the buildings did not occupy the land to the exclusion of everything else, and a half or three-quarter mile board track was made around them for the testing of cars. The Winton restaurant constitutes a department that was added and housed in 1905. Last year the machine and paint shops were enlarged by a 25-foot addition on the side fronting the Berea road, as well as by a second story on both and a third story over the east end of the machine shop to accommodate the draughting department. Some idea of the extent of the plant as it stands to-day may be had from the illustration of the factory and its surroundings printed below.



BIRD'S EYE VIEW OF THE PRESENT EXTENSIVE PLANT OF THE WINTON MOTOR CARRIAGE COMPANY, CLEVELAND, O.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Plans are under way for a new building on Michigan avenue for the Chicago store of the Pierce Engine Company, of Racine, Wis. It will be located south of Fourteenth street.

Announcement is made by the Larchmont Automobile Company, of Larchmont, N. Y., of the opening of a first-class garage on the Post road between Larchmont and Beach avenues.

The York Motor Car Company, of York, Pa., is experiencing a very busy season. The company is now turning out Pullman cars at the rate of eight per week, and one-half of the season's output will be delivered by April 1.

The Maxwell alcohol economy run to be held from Trenton to Atlantic City has been postponed until April 5, as it was found impossible to put the car selected for the test in the best condition for the run before that time.

The Carter Motor Car Corporation announces that a selection is about to be made of a tract of land near Washington, D. C., as a site for their new factory. The location is an ideal one, having excellent shipping facilities and being easily accessible by electric cars.

Arrangements have been perfected between the directors of the Geneva, N. Y., Chamber of Commerce and David Reid, president of the Motor and Manufacturing Works Company, of Ithaca, to remove the industry to Geneva. The new company will have a capital of $40,000.

"The automobile buying public will soon learn," says Charles B. Shanks of the Winton company, "that no quantity of special steels in an automobile can offset ignorance of the 'know how.' It is always safest to buy cars made by men of the broadest experience, for they are the only ones who know how, when, why and where to use and not to use special steel mixtures."

In New York State the registration of automobiles has reached the great figure of 37,850. Allowing for registered cars not in use and the sales of cars a second time, it is estimated that more than 30,000 automobiles are employed in this State. Of this number it is figured that 15,000 are owned in New York City. In registrations New Jersey stands second to New York, with a total of 26,650 to the end of March. Massachusetts has a total of 18,170 and Pennsylvania 3,775.

"Procrastination," says a well-known Columbia dealer, "is one of the worst features of the average autoist. He thinks that a car should perform consistently day after day without so much as a casual looking over. A little oil here and there, taking up the chain slack, maintaining a constant oil level, care in engaging the clutch and shifting gears, keeping contacts bright and clean—in fact, any of these numerous little operations which could be performed in periodical inspections would easily keep the car up to the highest standard of ef-

Asked in relation to the annual Orphans' Day outing, inaugurated by the New York Motor Club, R. M. Owen of the Owen company, distributors for the Reo and Premier, says that he is in hearty accord with the plan of taking a great number of parentless children to Coney Island for a day's pleasure trip. Mr. Owen further says: "We will be pleased to furnish Reo and Premier touring cars. Movements of this nature should receive the hearty support of dealers, for they tend to cultivate a friendly public attitude towards motorists as a whole, the benefits of which to the trade cannot be overestimated."

One of the most popular shock absorbers and jolt eliminators now in use is that made by the Hotchkin Manufacturing Company of Chicago. The Hotchkin device sets on the springs and the principle of operation is a piston working in a circular cylinder, alternately forcing glycerine through a large check valve and a small needle valve. On the downward compression motion the glycerine passes through the check valve without resistance, and returns to the cylinder, allowing free play to the springs. The slightest pressure on the recoil closes the check valve, the piston reverses, and forces the glycerine through the needle valve, which is regulated from the outside to the exact pressure required to check the recoil and bring the car back to its normal position, slowly, without jar or jolt, a feature upon which the manufacturer of the Hotchkin lays much stress.

NEW AGENCIES ESTABLISHED.

George L. Lyon, State agent for the Reo automobile, has made a contract with Messrs. Ham & Ross to handle the Reo in Charlotte, N. C.

The Orlando-Kessler Auto Company is a new concern located at 36 West Capital street, Columbus, O. Lozier and Autocar are represented.

A recent addition to the Boston auto trade is the Atlas runabout, made in Springfield and sold in Boston by J. W. Crowell at 92 Massachusetts avenue.

The Franco-American Auto and Supply Co., of Chicago, announces the appointment of the following agents as distributors of Michelin tires and the territory covered by each: Curtin & Williams Co., Columbus, O.; Coughlin & Davis, Cincinnati, O.; H. B. Groves Company, Sioux City, Ia.; Norris Automobile Company, Saginaw, Mich.; Kirk Bros.' Motor Car Company, Toledo, O.; Fawkes Automobile Company, St. Paul and Minneapolis, Minn.; W. C. Anderson, Cleveland, O., and radius of fifty miles; Western Auto Supply Company, Cedar Rapids, and Eastern Iowa.

PERSONAL TRADE MENTION.

W. R. Walton has been appointed Northwestern representative of the Firestone Tire and Rubber Company, traveling out of Chicago. Mr. Walton was formerly Wisconsin representative of the Fisk Rubber Company.

A. W. Church, secretary of Wyckoff, Church & Partridge, is expected to arrive in New York shortly, having recovered from the accident that he met with some time ago while returning in his carriage from the theater.

RECENT TRADE PUBLICATIONS.

The Victor hand-forged automobile is a simple, low priced machine for which many claims are made in the booklet just published by its manufacturers, the Victor Automobile Manufacturing Company, 171 Carroll street, St. Louis, Mo.

The feature of the smart little catalogue on Albany grease, made by Adam Cook's Sons, 313 West street, New York, is that it gives general directions on how and how often to lubricate such important parts as axle bearings, gear case, steering gear, chains, etc.

Catalogue twenty-two, from the Manhattan Electrical Supply Company, Park place and Murray street, New York, contains something electrical for everybody. The entire field of electrical appliances is covered and of course the automobilist's requirements are not overlooked. Each article is described, illustrated and priced.

A special circular has been issued by the Motor and Manufacturing Works Company, Ithaca, N. Y., on their well-known types of ejector mufflers. The booklet contains a complete price list, a description of the features of this type of muffler, and full particulars of the various types manufactured for automobiles, marine and stationary engines.

Cold drawn seamless steel work as produced by the Nortmann-Duffke Foundry Company, Twenty-sixth and Layton avenues, Milwaukee, Wis., is described in the company's new catalogue. The work includes seamless steel reservoirs, carbonate shells, cylinder tanks, crucible steel castings, gray iron castings, etc. They are all fully dealt with in the booklet.

The Great Smith catalogue is an elegant production, dealing worthily with the Great Smith, built by the Smith Auto Company, of Topeka, Kan. The description is complete, the illustrations are excellent, and altogether the catalogue is one which presents the Smith in a very interesting manner. The catalogue can be obtained from headquarters or from the New York agency, 1855 Broadway.

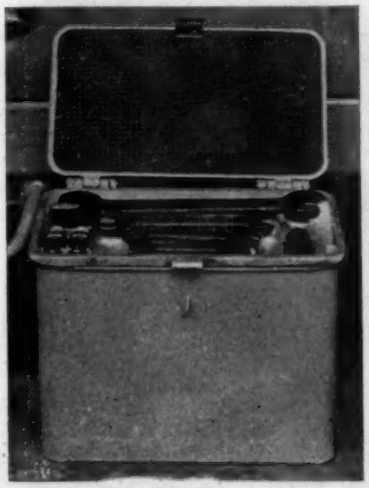
"Betty" has come to town. Her arrival is not likely to pass unnoticed, for "Betty" is the Goodrich girl—the Goodrich girl divine. She is a handsome girl, too. She has no designs, but simply asks a place. If she has not called upon you, a word to the B. F. Goodrich Company at Akron, O., will bring her. To the small number out of the pale of Goodrich acquaintanceship she will cost 75 cents, postpaid, to applicants by mail.

AN EFFECTIVE SIGNAL GONG.

A signal which sends an alarm far ahead of the automobile is always a necessary fitting. The Watres auto gong, which has been marketed by the Watres Manufacturing Company of 1139 Broadway, is a powerful three-tone chime gong operated by the exhaust stored in a separate tank. By this system the signal can be sounded at all times, when the car is running down hill with the engine dead, or when the auto is at a standstill. The device is simple to attach, requires no special machine work and sells at a moderate price.

INFORMATION FOR AUTO USERS.

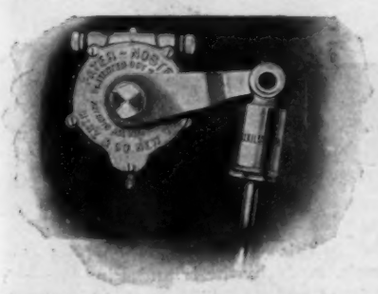
A Novelty in Tool Boxes.—Some time since, a Rambler dealer, on a visit to the factory at Kenosha, was shown the drafting room. He was interested in the cases of drawing instruments, with each article in a compartment adapted thereto, and finally expressed himself thus: "Say, why can't we have cases like



RAMBLER TOOL BOX.

that so that our tool boxes won't sound like a junk shop in a cyclone and a man may be able to get what he wants when he wants it without digging for it." The outgrowth of the suggestion is a double-top tool box as shown in the accompanying illustration. The entire cover is aluminum with the lower section designed to hold four wrenches, two spark plugs and a socket wrench. A rubber lining in the cover prevents rattling and displacement of the tools. The latch is so constructed that the entire cover may be raised, giving access to the body of the box without releasing the latch holding the two portions of the cover together. It is now a part of the regular equipment of all Rambler cars.

The "Pater-Noster" Shock Absorber.—Experience and patient investigation extending over a number of years has demonstrated that the solution of the suspension problem appears to point in the di-

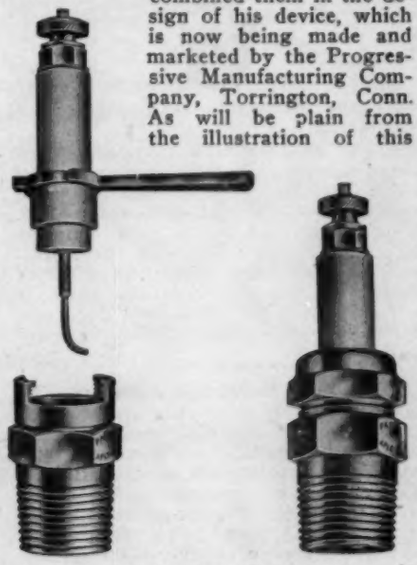


PATER-NOSTER SHOCK ABSORBER.

rection of auxiliary shock dampening devices rather than more or different kinds or sizes of springs, as despite the great improvements in the latter during the period in question, there is no doubt in the mind of any designer at the present day of the necessity of a shock absorber on the car. In view of this, a description of the Pater-Noster, which is the result of three years' study on the part of the European house of Herz & Company, and is manufactured by the same concern at their works at 203-205 Lafayette street, New York City, will be found of interest. Patents have been taken out in a number of different countries, and the Pater-Noster has been widely adopted on the Continent before its advent on this side of the Atlantic. In its design, both the upward and the downward movement of the car are taken into consideration, so that each movement may be checked separately.

It consists of two brake bands side by side, working on two separate drums. One of these drums is cast integral with a sleeve sliding over a central bronze arbor extending out of the bronze casing which encloses the whole mechanism. The other brake drum is connected with the central arbor only through the medium of a roller clutch. The entire mechanism is encased in a bronze housing which is filled with glycerine. The roller clutch allows the free downward movement of the spring and holds in but one direction, that of the recoil. The downward jar is taken care of by the second brake band, this being a particular feature of the Pater-Noster already made mention of. In the lever connecting the device with axle is inserted a device termed the "auxiliator," permitting short movements of the spring.

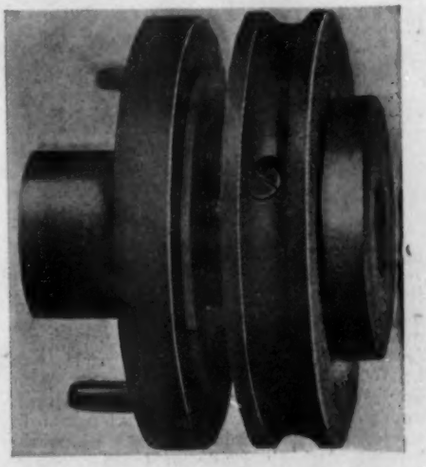
Brown Separable Lock Spark Plug.—Simplicity and ease of cleaning are two prime requisites of a good spark plug, and the inventor of the Brown separable lock plug has combined them in the design of his device, which is now being made and marketed by the Progressive Manufacturing Company, Torrington, Conn. As will be plain from the illustration of this



BROWN SEPARABLE LOCK PLUG.

plug showing it apart, the porcelain can be removed with half a turn without disturbing any other part of the plug, and without the aid of a wrench. Nor need the terminals be disconnected, as the porcelain does not turn in releasing. In addition to these advantages, the construction of the plug is designed to prevent carbon reaching the insulation. These plugs have been given a thorough trial in actual use extending over a lengthy period and have been found to give excellent service. Beside this plug on which patents have been applied for, the same concern also manufactures the Brown regular or standard spark plug, shown in the second illustration.

Kane Self Starting Device.—The fact that the gasoline motor has to be cranked to get it under way has always been considered one of the greatest drawbacks of the automobile. Devices innumerable have been invented to overcome this fault, and more and more attention is being paid to the question of evolving a device that will be at once simple, practical and inexpensive, not to mention that chief requirement of all, re-



KANE SELF-STARTER FOR MOTORS.

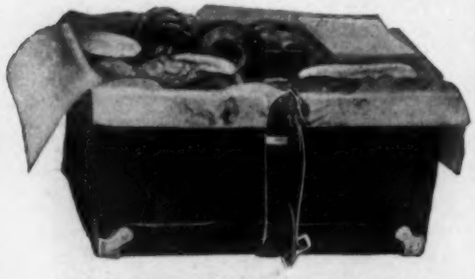
liable. The Kane Starting Device Company, 762 Junction avenue, Detroit, Mich., have just brought out the mechanism shown in the accompanying illustration, which is small and is attached where the starting crank connects with the motor shaft. It is placed under cover and is operated from the driver's seat. It consists of two roller ratchets and a wedge chair so arranged that the slightest backward movement of the motor releases the grip on the shaft entirely. The main or working ratchet is released by wedges which act only on the reverse action of the motor. On the secondary ratchet there are 45-degree grooves, engaging with internally cut grooves of the same pitch in the outer member surrounding the secondary ratchet.

The outer member cannot revolve, being held in position by pins, but reverse action of the motor and the working of the secondary ratchet makes a positive movement of the outer member toward the main ratchet thereby forcing the wedges behind the rollers and causing a positive release of the shaft. When the reverse action of the motor ceases, the wedge chair is returned to its normal position by springs operating between the main ratchet and wedge chair which also force the outer member of the secondary ratchet to its place.

Lubricating Oils for Special Purposes.—The Underhay Oil Company, Boston, Mass., are sending out an attractive folder in colors showing on the outside a Continental soldier aiming his old flintlock intently at something in the dis-

tance. It is captioned "Our Aim," and the makers go on to state that this is to produce a line of lubricating oils of superior and uniform quality, especially adapted for the purpose to which they are to be applied, and on that account the most economical in service. Some of their brands are "Premium Valve Cylinder," "216 D. Cylinder," "Monarch Cylinder," "Electric Cutting" and a number of others.

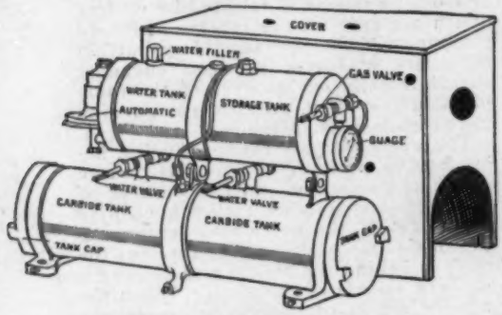
The Auto Folding Lunch Box.—Nothing is quite so conducive to good appetite as a spin over country roads in fine weather, and when it is a question of



A HANDY LUNCH BOX FOR AUTOISTS.

catering to the internal wants of the passengers of a touring car no little space is required to accommodate a sufficient quantity of edibles. To provide a handy means of carrying them, the Atlas Manufacturing Company, Hampton, N. H., has brought out a line of auto folding lunch boxes. They are made in various sizes, operating on the same general principle as is usually employed in collapsible boxes. A high grade of leather board is employed and well braced, the sections being bound together with leather hinges, making them light and strong.

Convenient Acetylene System.—Up to the present, acetylene gas has always been generated as used, or carried in special tanks under pressure on the automobile, but the Eco Manufacturing Company, 53 State street, Boston, Mass., manufactures a device that automatically makes and stores the gas in a tank ready for use—a method that possesses many advantages. The flow of water is con-



AUTOMATIC ACETYLENE GAS SYSTEM.

trolled by a diaphragm regulator operated by the pressure of the gas, but as a further precaution the generator is provided with bronze safety valve set to blow off at a low pressure. The generator proper consists of an upper and lower tube, the latter divided to form two carbide chambers; threaded caps close the ends of these chambers, making them gas tight. Each chamber accommodates a basket for the carbide. The upper tube is also divided into two parts, consisting of a water tank and a storage tank. The former is provided with a gas-tight filling vent and an outlet level with the bottom of the tank, to which is attached the automatic water valve. From the latter, two pipes lead to the carbide chambers, with shut-off needle valves independent of the automatic valve, to stop the flow of water when the generator is not to be used for some time or when recharging.

The storage tank has a safety valve, gas outlet, pressure gauge connection and reducing valve in piping leading to the lamps. The generator is so designed that no water can possibly reach the carbide except through the automatic regulating valve, so that the vibration of a car or the rolling of a boat does not affect it. The best of Tobin and phosphor bronze is used throughout in its construction, making the generator an ideal device for touring or yachting, as several weeks' supply of gas may be carried in the form of carbide in a small space.

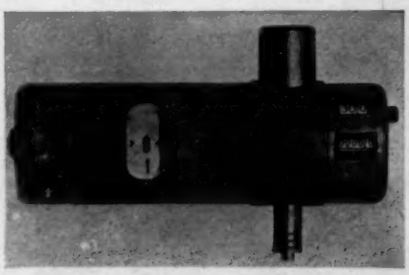
Compression and Valve Tester.—Under the title of the "Compressometer," Henry W. Brown, Syracuse, N. Y., is placing on the market a device that will be found very convenient when the location of a fault in the compression of a cylinder, whether through defective piston rings, or from poorly seated valves, is in ques-

THE BROWN COMPRESSOMETER.

tion. It consists of a frictionless 100-pound gauge, the indicating point of which remains at the highest point reached until returned to zero by hand. A unique ground swivel joint connects the cylinder under test with the instrument. This joint, which permits of placing the gauge face at any angle, is independent of the instrument itself and screws into the cylinder like an ordinary spark plug.

A Radically Novel Speedometer.—The Casgrain speedometer has the decided advantage that the dial movement is practically one-half inch for each mile instead of six miles in every half inch of dial, as is sometimes the case. In other words, the progressive miles on the dial, from 0 to 65, extend over a distance of twenty-eight inches. This not only gives figures of good size and for every mile, but it means that if the figures are out of adjustment 1-4 inch the instrument would not be more than 1-2 mile away from the accurate reading, while on a 5-inch indicator reading the same 1-4 inch out of adjustment would mean nearly six times that inaccuracy, or about three miles. This ought to give thought to those looking for accuracy and a dial easily read because of its slow movement.

To give this long reading, the figures run around a barrel in a helical line of a fraction more than four turns. On the inside of this barrel are inwardly projecting vanes and the barrel itself moves back and forth on a center worm corresponding in pitch to the helix of mile figures. Outside this barrel is the enclosing case with an opening through



FRONT VIEW OF CASGRAIN SPEEDOMETER.

which the reading becomes visible. The usual flexible shaft is used to operate the instrument, but this shaft only moves a second shaft in the instrument itself, there being no mechanical connection between the indicator and this mechanism. This second shaft is at a right angle with the entrance of the flexible shaft, and carries a simple two-bladed paddle wheel. The two blades project inwardly from their driving shaft, moving around the concentric well between the vanes of the barrel and the central worm on which the barrel moves. In this well is carried a liquid which as it is revolved by the paddles, acts as a drag on the vanes of the barrel. From this the barrel moves back and forth on its central worm in proportion to the drag on its vanes, the latter proportioning itself to the speed of the paddle wheel. The instrument also carries a trip and a total reading odometer. The Casgrain Speedometer is made by W. J. Connell, 36 Columbus avenue, Boston Mass

A Handy Tool.—Nothing facilitates repairs and adjustments so much as a tool that "is always on the job." Whether the work in hand be one thing or another, it is apt to consist for the most part of dismantling and reassembling and it is in these operations that a handy tool saves time and temper. One that

IRLAND PIPE WRENCH.

comes in this category is the Irland pipe wrench, made by the Irland Pipe Wrench Company, 15 Court Square, Boston, Mass. It has no slow screw adjustment, but is instantaneous in action and firmly grips anything that comes within its range without binding—features that are appreciated when adjustments are being made beneath the car. It is made in sizes designed to grip anything from a 1-8-inch wire up to a 1 1-2-inch pipe, with handles of lengths to correspond.